



Serial No. 09/498801

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: G. Boyd et al. Examiner: Ricky D. Shafer
Serial No.: 09/498801 Group Art Unit: 2872
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Title: ILLUMINATION SYSTEM FOR REFLECTIVE DISPLAYS

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The undersigned hereby certifies that this Transmittal Letter and the paper or fee, as described herein, are being deposited with the United States Postal Service 'Express Mail Post Office To Addressee' service under 37 CFR 1.10 and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

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APPELLANT'S BRIEF ON APPEAL

BOX AF
Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

This Appeal Brief is presented in support of the Notice of Appeal submitted to the U.S. Patent and Trademark Office by facsimile on January 13, 2003, from the final rejection of claims 1-9 and 12-16 of the above-identified application, as set forth in the Office Action dated September 12, 2003.

A check for \$320.00 to cover the required fee for filing this Brief is enclosed. An original and two copies of the Brief are enclosed herewith.

I. REAL PARTY OF INTEREST

The Real Party of Interest is 3M Innovative Properties Company, a Delaware corporation and a wholly owned subsidiary of 3M Company. 3M Innovative Properties Company is the assignee of the instant application.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences for the above-referenced patent application.

III. STATUS OF CLAIMS

Claims 1-9 and 12-16, as set forth in Appendix 1 attached herewith, are pending and are the subject of the present appeal.

The case was originally filed with claims 1-35. In a paper issued on May 22, 2001 (Appendix 2-A), Applicants were required to elect one of twelve species. In a response dated June 6, 2001 (Appendix 2-B), Applicants provisionally elected species E, indicating that claims 1-3, 10-14, 17-21, 26 and 28-35 read on the elected species. A second species election was issued on August 27, 2001 (Appendix 2-C), but this was withdrawn following an interview between the below-signed attorney and Ms.

Cassandra Spyrou, SPE. In the interview, there was oral agreement to restrict the case to claims 2-9 and 12-16, and generic claim 1, and to withdraw claims 10, 11 and 17-35. This restriction was confirmed in the Office Action dated Feb. 13, 2002 (Appendix 2-D).

In a subsequent response, mailed on June 13, 2002 (Appendix 2-E), Applicants added new claims 36-38. In the Final Office Action date Sept. 12, 2002 (Appendix 2-F), claims 36-38 were withdrawn from consideration. Consequently, claims 10, 11 and 17-38 are currently withdrawn from consideration, and claims 1-9 and 12-16 are pending.

IV. STATUS OF AMENDMENTS

An Amendment, responsive to the final Office Action dated September 12, 2002, was submitted by Applicants on December 12, 2002 (Appendix 2-G). In this Amendment, claim 12 was amended and arguments were presented distinguishing the claimed subject matter from the cited prior art.

By way of Advisory Action mailed January 8, 2003 (Appendix 2-H), this Response was deemed not to place the application in condition for allowance. It was stated in the Advisory Action, however, that the amendment to claim 12 will be entered

upon filing of this Appeal Brief. The Advisory Action indicated that the claimed subject matter remained rejected for the reasons set forth in the final Office Action. Consequently, the list of claims presented in Appendix 1 includes the amendment to claim 12 submitted on December 12, 2002.

V. SUMMARY OF THE INVENTION

The invention is generally directed to an illuminated display device, for example as might be used in the eyepiece of a video camera (FIG. 2), or the like. A general embodiment of the illuminated display device is schematically presented in FIG. 5, and is described at page 8, lines 10-28. FIG. 5 shows a light source 502 that directs light 510 generally along a first axis 504 to a reflective image display unit 506 via a reflective polarizing film 512. The reflective image display unit 506 is disposed with its optical axis 508 substantially parallel to the first axis 504 of the light source. The light directed to the reflective image display unit 506 is in the polarization state that is reflected by the reflective polarizing film. The reflective image display unit 506 modifies the polarization of various portions of the incident light, so that the reflected light contains a polarization-modified image. The reflected light is incident on the reflective polarizer film 512, which transmits that portion of the polarization-modified image that is in the pass polarization state, and which rejects that portion of the light that is in the reflected polarization state. This separates the image light from the unwanted light so that the viewer is able to perceive the image by viewing the light transmitted through the reflective polarizer film 512 from the image display unit 506.

Several examples of the particular invention of the claim 1 are described in the drawings. One example is schematically represented in FIGs. 11A-11C, and described at page 17, line 11 – page 18, line 17. The display device includes a first light source 1102 on a mount having a mount surface and directing light generally along a first axis. A reflective image display unit 1104 is also disposed on the mount surface with an optical axis substantially parallel to the first axis. A reflective polarizing film is disposed to direct light from the first light source to the reflective image display unit.

Claim 2 is directed to the reflective polarizing film being curved in at least one direction, for example as is described in the Specification at page 13, line 13 – page 14, line 6 and, for example illustrated as reflective polarizer 822 in FIG. 8B. Other examples of the invention of claim 2 are presented in the application.

Claim 3, which depends from claim 2, is directed to the optical axis of the reflective image display unit being laterally displaced from the first axis in a displacement direction and the reflective polarizing film is curved with a radius of curvature lying parallel to a plane formed by the first axis and the displacement direction. One example of this is schematically illustrated as the reflective polarizer 822 in FIG. 8B, described at p. 13, lines 18-21. Other examples of the invention of claim 3 are presented in the application.

Claim 4, which depends from claim 2, is directed to the optical axis of the reflective image display unit being laterally displaced from the first axis in a displacement direction and the reflective polarizing film being curved with a radius of curvature lying parallel to a plane formed by the first axis and an axis orthogonal to both the first axis and the displacement direction. One example of this is schematically illustrated in FIG. 8C, which shows a reflective polarizer 832 that is curved out of the plane of the figure, and is described at page 14, lines 3–5. Other examples of the invention of claim 4 are presented in the application.

Claim 5, which depends from claim 2, is directed to the optical axis of the reflective image display unit being laterally displaced from the first axis in a displacement direction. The reflective polarizing film is curved with a first radius of curvature lying parallel to a plane formed by the first axis and the displacement direction and is curved with a second radius of curvature lying parallel to a plane formed by the first axis and an axis orthogonal to both the first axis and the displacement direction. One example of this is schematically illustrated in FIG. 8C, which shows a reflective polarizer 832 that is curved out of the plane of the figure, and is described at page 14, lines 3–5. Other examples of the invention of claim 5 are presented in the application.

Claim 6, which depends from claim 2, is directed to a first portion of the reflective polarizing film being displaced from the first light source along the first axis and a

second portion of the reflective polarizing film being displaced from the reflective image display unit along the optical axis. One example of this is illustrated in FIG. 9B, which shows a reflective polarizer 922 having a portion above the light source 902 and a portion above the image display unit 906. This is described at page 15, lines 17-23. Other examples of the invention of claim 6 are also presented in the application.

Claim 7, which depends from claim 6, is directed to the first portion of the reflective polarizing film being curved. One example of this is illustrated in FIG. 9B, which shows a reflective polarizer 922 having a curved portion above the light source 902. This is described at page 15, lines 17-23. Other examples of the invention of claim 7 are presented in the application.

Claim 8, which depends from claim 6, is directed to the second portion of the reflective polarizing film being curved. One example of this is illustrated in FIG. 9B, which shows a reflective polarizer 922 having a curved portion above the image display unit 906. This is described at page 15, lines 17-23. Other examples of the invention of claim 8 are presented in the application.

Claim 9, which depends from claim 6, is directed to both the first and second portions of the reflective polarizing film being curved. One example of this is schematically presented in FIG. 9B, which shows a reflective polarizer 922 having a curved portion above the light source 902 and a curved portion above the image display unit 906. This is described at page 15, lines 17-23. Other examples of the invention of claim 9 are presented in the application.

Claim 12, which depends from claim 1, is directed to a reflector that is disposed to direct light from the first light source to the reflective polarizing film. One example of this is schematically illustrated in FIG. 5, in which the reflector 514 directs light 510 from the light source 502 to the image display unit 506. This is described at page 8, lines 16-28. Other examples of the invention of claim 12 are presented in the application.

Claim 13, which depends from claim 12, is directed to at least one of the reflector and the reflective polarizing film being curved in at least one dimension to form a curved reflector. One example of this is presented in FIG. 7A, which shows a curved reflector 714 and a curved reflective polarizer 712. This is described at page 11, line 31 – page

12, line 10. Other examples of the invention of claim 13 are presented in the application.

Claim 14, which depends from claim 13, is directed to the optical axis of the reflective image display unit being laterally displaced from the first axis in a displacement direction. The reflective polarizing film is curved with a radius of curvature lying parallel to a plane formed by the first axis and the displacement direction. One example of this is schematically illustrated as the reflective polarizer 822 in FIG. 8B, described at p. 13, lines 18-21. Other examples of the invention of claim 14 are presented in the application.

Claim 15, which depends from claim 13, is directed to the optical axis of the reflective image display unit being laterally displaced from the first axis in a displacement direction. The reflective polarizing film is curved with a radius of curvature lying parallel to a plane formed by the first axis and an axis orthogonal to both the first axis and the displacement direction. One example of this is schematically illustrated in FIG. 8C, which shows a reflective polarizer 832 that is curved out of the plane of the figure, and is described at page 14, lines 3-5. Other examples of the invention of claim 15 are presented in the application.

Claim 16, which depends from claim 13, is directed to the optical axis of the reflective image display unit being laterally displaced from the first axis in a displacement direction. The reflective polarizing film is curved with a first radius of curvature lying parallel to a plane formed by the first axis and the displacement direction and is curved with a second radius of curvature lying parallel to a plane formed by the first axis and an axis orthogonal to both the first axis and the displacement direction. One example of this is schematically illustrated in FIG. 8C, which shows a reflective polarizer 832 that is curved out of the plane of the figure, and is described at page 14, lines 3-5. Other examples of the invention of claim 16 are presented in the application.

VI. ISSUES PRESENTED FOR REVIEW

A. Whether claim 1 is rejected under 35 U.S.C. § 102(b) as being anticipated by Uchiyama et al. (U.S. Patent No. 5,800,032) (Uchiyama).

B. Whether claims 1 and 12 are rejected under 35 U.S.C. § 102(e) as being anticipated by Schehrer et al. (U.S. Pub. No. 2002-0003508-A1) (Schehrer).

C. Whether claims 1, 12 and 13 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Handschy et al. (U.S. Patent No. 5,596,451) (Handschy '451).

D. Whether claims 2-9 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Uchiyama.

E. Whether claims 2-9 and 13-16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Schehrer.

F. Whether claims 2-9 and 14-16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Handschy '451 in view of Handschy et al. (US Patent No. 5,808,800) (Handschy '800).

VII. GROUPING OF CLAIMS

For consideration on this appeal, Appellant has grouped the Claims according to the grounds of rejection made in the final Office Action, as shown below:

Issue A: Claim 1 only

Issue B: Group 1: Claims 1 and 12

Issue C: Group 1: Claim 1, 12 and 13

Issue D: Group 1: Claims 2-9

Issue E: Group 1: Claims 2-9, 13-16

Issue F: Group 1: Claims 2-9, 14-16

VIII. ARGUMENTS

Issue A: 102 Rejection of claim 1 based on Uchiyama

Claim 1 is rejected under 35 U.S.C. §102 (b) as being anticipated by Uchiyama et al. (U.S. Patent No. 5,800,032) (Uchiyama).

Uchiyama teaches, for example as disclosed in FIGs. 2 and 16, a projection system that has a light source (2) fixed to a fixing member (8) that is mounted on the upper, inside surface of a case (1). Light from the light source passes into a polarized beam splitter (4), which directs the light to a cross dichroic mirror (5). The cross dichroic mirror separates the incoming light into three different color bands, blue, green and red, and directs each color band to respective light modulation elements (6B, 6G and 6R). The cross dichroic mirror, the polarized beam splitter and the modulation elements are supported on a frame (9) within the case (col. 1, line 65 – col., 2, line 3).

The light modulation elements spatially modulate the light, which is then reflected and combined in the dichroic mirror. The modulated light passes through the polarized beam splitter to the projection optical system (7), which transmits the image to a projection screen. The projector system is placed on a desk or special stand (10) and the height of the case on the stand is adjustable via the use of height adjusting mechanisms (13) (col. 2, lines 4-18).

The invention of claim 1 is directed to an illuminated display device that includes a first light source disposed on a mount having a mount surface. The first light source directs light generally along a first axis. A reflective image display unit is disposed on the mount surface with an optical axis substantially parallel to the first axis. A reflective

polarizing film is disposed to direct light from the first light source to the reflective image light display unit.

To anticipate a claim, the reference must teach every element of the claim. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628,631, 2 USPQ2d 1051 1053 (Fed. Cir.) 1987). "The identical invention must be shown in as complete detail as is contained in the...claim." Richardson v. Suzuki Motor Co., 868 F. 2d1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Therefore, if a reference does not teach every element of the claim, then the reference does not anticipate the claim (MPEP § 2131).

Uchiyama fails to teach all the elements of claim 1. According to claim 1, the first light source and the reflective image display unit are both mounted to the same mount surface of the mount. Uchiyama fails to teach this arrangement of components. Instead, Uchiyama teaches, in FIGs. 2 and 16, that the light source is mounted to a fixing member that is suspended from the upper surface of the projector casing. The blue spatial light modulator is mounted to the cross-dichroic mirror and the red spatial light modulator is mounted between the cross dichroic mirror and the frame. Neither of the red or blue modulators are mounted to the fixing member, nor is the light source mounted to the mounting surface of the frame. Accordingly, Uchiyama fails to teach that the first light source and the image display unit are mounted on the same surface.

It is stated in the Office Action of Sept. 12, 2003, that Uchiyama's desk or stand (10) may be taken as being the mount of claim 1. Applicants respectfully disagree with such a characterization of the reference. The light source is not mounted to the desk's surface, but is instead mounted to the projector's casing. In addition, the spatial modulators are not mounted to the desk's surface, but are mounted to the frame. The frame and the casing form part of the projector that sits on the desk. Furthermore, Uchiyama teaches that the projection system merely sits on the desk or the stand – Uchiyama does not teach that the desk or stand is part of the projection system itself. Accordingly, the desk cannot reasonably be considered to be part of the projection system.

In view of the above, Uchiyama fails to teach all the elements of claim 1, and claim 1 is patentable over Uchiyama.

Issue B: 102 Rejection of claims 1 and 12 based on Schehrer

Claims 1 and 12 are rejected under 35 U.S.C. §102 (e) as being anticipated by Schehrer et al. (U.S. Pub. No. 2002-0003508-A1) (Schehrer).

Schehrer teaches an image generator having a miniature display device. The Office Action of Sept. 12, 2002, points particularly to FIGs 1A, 7, 8, and 10a - 10d as being the most relevant figures.

FIG. 1 is a generic figure that shows generalized elements of the display device. In particular, FIG. 1A shows a box representing an image generator, a box representing optics and a human eye. FIG. 1A does not show a first light source mounted on a mounting surface of a mount, nor a reflective image display unit, nor a reflective polarizing film.

In the embodiment illustrated in FIG. 7, Schehrer teaches a light source (501) that directs light from a mirror (502) to a polarizing beamsplitter 505. The light reflected by the polarizing beamsplitter is directed to a spatial light modulator (SLM) 504. The modulated light reflected from the SLM passes through the polarizing beamsplitter to the viewing lens. In this particular embodiment, the light source is oriented so as to direct light in a direction that is parallel to the direction of light incident on the SLM. No mount having a mounting surface is shown in FIG. 7.

The embodiment illustrated in FIG. 8 shows an illumination generator 510 that directs light along a light pipe 511 to a turning mirror 512. The turning mirror directs the light to a polarizing beamsplitter 505, which reflects the light to the SLM (504). The illumination generator is oriented so that it directs light in a direction that is parallel to the direction in which light is incident on the SLM. No mount having a mounting surface is shown in FIG. 8.

The embodiment illustrated in FIGs. 10a-10d shows a display in which a light box (533) is mounted on a frame (534) that has two angled wings that support a turning mirror (532) (para. 68). The plane of the output port of the light box is tilted relative to

the optical axis through the display (504) and the viewing lens (531) (para. 67). It is not clear whether or not the light box is mounted to the frame. The display, or SLM, is however, not mounted to the frame.

Applicants respectfully assert that Schehrer fails to teach all of the elements of claim 1. In particular, Schehrer fails to teach that the light source is mounted on the same mounting surface as the SLM, and has a first axis parallel to the optical axis of the SLM. Instead, in the embodiments shown in FIGs. 7 and 8, no disclosure is provided to explain how the SLM and the light source are mounted. It is unclear from these figures how the light source could be mounted on the same mounting surface as the SLM, given that the display and the light source are removed from each other, do not share a common plane and, in fact, point in opposite directions. Instead, the light sources of FIGs. 7 and 8 lie well out of the plane of the SLM so that the light generated by the light source initially propagates in the same direction as that of the light incident on the display. This is different from the claimed invention where, as a result of the claimed structure, the light generated from the light source initially propagates in substantially the same direction as that of light reflected from the imager, and not in the same direction as light incident on the imager (for an example see FIG. 12 of the present invention).

With regard to the device shown in FIGs. 10a-d, Schehrer likewise fails to teach that the light source is mounted on the same mounting surface as the reflective image display unit, and has a first axis parallel to the optical axis of the display unit. The light box is mounted below the turning mirror, in a position to the outside of the frame – see FIGs. 10a and 10c. The SLM, on the other hand is positioned to the other side of the frame - see FIG. 10a. Clearly, there is no common surface on which the light source and the display are both mounted, and so Schehrer's FIGs. 10a-d also fail to show the elements of claim 1.

Since Schehrer fails to teach the elements of claim 1, claim 1 is not anticipated by Schehrer and is, therefore, allowable thereover.

Dependent claim 12, which depends from claim 1 and further defines the invention of claim 1, was also rejected under 35 U.S.C. §102(e) as being anticipated by

Schehrer. While Applicants do not acquiesce with the particular rejection to this dependent claim, it is believed that this rejection is moot in view of the remarks made in connection with independent claim 1. Therefore, dependent claim 12 is also in condition for allowance.

Issue C: 103 Rejection of claims 1, 12 and 13 based on Handschy '451

Claims 1, 12 and 13 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Handschy et al. (U.S. Patent No. 5,596,451) (Handschy '451). The Office Action points out the embodiment shown by Handschy '451 in FIG. 2B as being particularly relevant.

Handschy '451 teaches, in FIG. 2B, a projection system having an illumination arrangement (34) that directs light into a polarization cube (48). The light passes through the cube to a spatial light modulator (36) (SLM) located on the other side of the cube from the illumination arrangement. Image light, reflected by the SLM, is deflected by the cube to a mirror (42). The image light also double-passes a quarter-wave plate so that the image light reflected by the mirror is directed through the cube to the viewer (24).

It is stated in the Office Action that Handschy fails to explicitly illustrate that the illuminated display device includes a mount having a mounting surface. It is further stated in the Office Action that it would have been obvious and/or within the level of one of ordinary skill in the art at the time the invention was made that each of the elements of the illuminated display device taught by Handschy would include a supporting substrate and it would have been obvious to mount the elements on the same supporting substrate in order to maintain better optical alignment when the display device is mounted onto a helmet or a pair of glasses.

Three criteria must be met to establish a *prima facie* case of obviousness. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference. Second, there must be a reasonable expectation of success. Finally, the prior art reference, or combination of references, must teach or suggest all the claim

limitations. MPEP § 2142. Applicant respectfully traverses the rejection since the prior art fails to disclose all the claim limitations, and one of ordinary skill in the art would not have been motivated to modify the device taught by Handschy in the manner proposed.

Group 1

First, Handschy '451 does not teach or suggest a polarizing beamsplitter that directs light from the first light source to the reflective image light display unit, as is required by claim 1. Instead, in the Handschy '451 device, the light from the light source passes directly through the polarizing beamsplitter to the SLM. In the Handschy '451 device, the polarizing beamsplitter serves the function of directing light reflected from the SLM to the curved mirror (42), which then reflects the light to the viewer. If the polarizing beamsplitter were removed from the Handschy '451 device, the light from the light source would still reach the SLM. Thus, the polarizing beamsplitter in the Handschy '451 device does not direct the light from the light source to the SLM.

This is an important difference between the Handschy '451 device and that of claim 1. In the Handschy '451 device, the polarizing beamsplitter reflects the image light reflected by the SLM. This configuration makes high demands on the flatness of the polarizing beamsplitter in order to maintain an undistorted image. On the other hand, in claim 1, the reflective polarizing film directs the illumination light to the reflective image display. As a result of the claimed configuration, the polarizing film transmits the image light, rather than reflecting the image light. Since the polarizing film of claim 1 does not reflect the image from the reflective image display, the requirements on the flatness of the polarizing film are considerably relaxed, relative to those in the configuration shown in Handschy '451.

Accordingly, Handschy fails to teach all the elements of claim 1.

Second, as is admitted in the Office Action of Sept 12, 2002, Handschy '451 is silent as to how the light source and spatial modulator are mounted, and does not teach or suggest a mount having a mounting surface. More importantly, Handschy '451 fails to teach or suggest that the light source and the spatial light modulator are mounted on the same mounting surface. In fact, Handschy '451 teaches a light source that is

placed in a position opposing the SLM and could not, therefore, be mounted on the same surface as the SLM. As was indicated above in the discussion of Schehrer, as a result of the claimed structure, the light generated from the light source initially propagates in substantially the same direction as that of light reflected from the imager, and not in the same direction as light incident on the imager. In contrast, in the device taught by Handschy '451, the light from the light source propagates in a direction substantially opposite that direction of the light reflected from the SLM.

Accordingly, it would not have been obvious to modify the device taught by Handschy '451 in the proposed manner to achieve the claimed invention, since placing the light source and SLM on the same mounting surface would have led to an inoperative device.

In summary, Handschy '451 fails to teach or suggest that the polarizing beamsplitter directs the light from the light source to the spatial light modulator in a configuration where the light source directs light along a first axis that is parallel to the axis spatial light modulator. Handschy '451 also fails to teach or suggest that the light source and the spatial light modulator are mounted on the same mounting surface.

Accordingly, since Handschy fails to teach or suggest all the elements of the claimed invention, claim 1 is not obvious in view of Handschy and is patentable thereover.

Dependent claims 12 and 13 are, for the purpose of this appeal, grouped with claim 1 and stand or fall with claim 1. Appellants do not admit, however, that claims 12 and 13 are not independently patentable 1.

Issue D: 103 Rejection of claims 2-9 based on Uchiyama.

For the purposes of this appeal only, claims 2-9 are grouped together. Appellants do not admit that there are no patentable differences among claims 2-9. Claims 2-9 depend from claim 1, either directly or indirectly. Since claim 1 is allowable, these claims are also allowable.

Issue E: 103 Rejection of claims 2-9 and 13-16 based on Schehrer

For the purposes of this appeal only, claims 2-9 and 13-16 are grouped together. Appellants do not admit that there are no patentable differences among claims 2-9 and 13-16. Claims 2-9 and 13-16 depend from claim 1, either directly or indirectly. Since claim 1 is allowable, these claims are also allowable.

Issue F: 103 Rejection of claims 2-9 and 14-16 based on Handschy '451

Claims 2-9 and 14-16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Handschy '451 in view of Handschy et al. (US Patent No. 5,808,800) (Handschy '800).

It is stated in the Office Action that Handschy '451 teaches all of the claimed subject matter, except for the reflective polarizer being curved, and that Handschy '800 teaches that it is known to provide a curved reflective polarizer in the same field of endeavor for the purpose of reducing the bulk and weight of a display system. It is further stated that it would have been obvious and/or within the level of one of ordinary skill in the art at the time the invention was made to modify the reflective polarizer (polarizing beam splitting cube) of Handschy '451 to include a curved reflective polarizer as taught by Handschy '800 in order to reduce the bulk and weight of the system.

Handschy '800 shows, in FIG. 11, a system having a light source (28) and a SLM (46). The light source directs light at an angle to axis of the SLM, towards a polarizing beamsplitter (102) that has a curved surface. The polarizing beamsplitter directs the illumination light to the SLM. The light reflected by the SLM passes through the polarizing beamsplitter to the eyepiece lens (36).

Handschy '800 fails to correct the deficiencies of Handschy '451 discussed above.

For the purposes of this appeal only, claims 2-9 and 14-16 are grouped together. Appellants do not admit that there are no patentable differences among claims 2-9 and 14-16. Claims 2-9 and 14-16 depend from claim 1, either directly or indirectly. Since claim 1 is allowable, these claims are also allowable.

CONCLUSION

Appellants respectfully submit that claims 1 and 12 are not anticipated by the cited art and that no *prima facie* showing of obviousness has been established with respect to claims 1-9 and 12-16, the rejections of which are contested by Appellants. It is earnestly requested that the rejections be reversed, and that all of the pending claims 1-9, and 12-16 be allowed.

If a telephone conference would be helpful in resolving any issues concerning this communication, please contact Iain A. McIntyre at 952-253-4110.

Respectfully submitted,

Altera Law Group , LLC



Date: April 14, 2003

By:

A handwritten signature in black ink, appearing to read 'Iain A. McIntyre', written over a horizontal line.
Iain A. McIntyre
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APPENDIX 1
THE CLAIMS ON APPEAL (as finally amended)

1. An illuminated display device, comprising:
 - a first light source disposed on a mount having a mount surface and directing light generally along a first axis;
 - a reflective image display unit disposed on the mount surface with an optical axis substantially parallel to the first axis; and
 - a reflective polarizing film disposed to direct light from the first light source to the reflective image light display unit.
2. A device as recited in claim 1, wherein the reflective polarizing film is curved in at least one dimension.
3. A device as recited in claim 2, wherein the optical axis of the reflective image display unit is laterally displaced from the first axis in a displacement direction and the reflective polarizing film is curved with a radius of curvature lying parallel to a plane formed by the first axis and the displacement direction.
4. A device as recited in claim 2, wherein the optical axis of the reflective image display unit is laterally displaced from the first axis in a displacement direction and the reflective polarizing film is curved with a radius of curvature lying parallel to a plane formed by the first axis and an axis orthogonal to both the first axis and the displacement direction.
5. A device as recited in claim 2, wherein the optical axis of the reflective image display unit is laterally displaced from the first axis in a displacement direction and the reflective polarizing film is curved with a first radius of curvature lying parallel to a plane formed by the first axis and the

displacement direction and is curved with a second radius of curvature lying parallel to a plane formed by the first axis and an axis orthogonal to both the first axis and the displacement direction.

6. A device as recited in claim 2, wherein a first portion of the reflective polarizing film is displaced from the first light source along the first axis and a second portion of the reflective polarizing film is displaced from the reflective image display unit along the optical axis.

7. A device as recited in claim 6, wherein the first portion of the reflective polarizing film is curved.

8. A device as recited in claim 6, wherein the second portion of the reflective polarizing film is curved.

9. A device as recited in claim 6, wherein both the first and second portions of the reflective polarizing film are curved.

12. A device as recited in claim 1, further comprising a reflector disposed to direct light from the first light source to the reflective polarizing film.

13. A device as recited in claim 12, wherein at least one of the reflector and the reflective polarizing film is curved in at least one dimension to form a curved reflector.

14. A device as recited in claim 13, wherein the optical axis of the reflective image display unit is laterally displaced from the first axis in a displacement direction and the reflective polarizing film is curved with a radius of curvature lying parallel to a plane formed by the first axis and the displacement direction.

15. A device as recited in claim 13, wherein the optical axis of the reflective image display unit is laterally displaced from the first axis in a displacement direction and the reflective polarizing film is curved with a radius of curvature lying parallel to a plane formed by the first axis and an axis orthogonal to both the first axis and the displacement direction.

16. A device as recited in claim 13, wherein the optical axis of the reflective image display unit is laterally displaced from the first axis in a displacement direction and the reflective polarizing film is curved with a radius of curvature lying parallel to a plane formed by the first axis and the displacement direction and is curved with another radius of curvature lying parallel to a plane formed by the first axis and an axis orthogonal to both the first axis and the displacement direction.

APPENDIX 2
OFFICE ACTIONS AND AMENDMENTS/RESPONSES

- A. First Requirement to Elect Species, May 22, 2001
- B. Election of Species, June 6, 2001
- C. Second Requirement to Elect Species, August 27, 2001
- D. First Office Action, February 13, 2002
- E. Response to First Office Action, June 13, 2002
- F. Final Office Action, Sept 12, 2002
- G. Response to Final Office Action, December 12, 2002
- H. Advisory Action January 8, 2003

Appendix 2A



UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER OF PATENTS AND TRADEMARKS

Washington, D.C. 20231

OFFICE OF INTELLECTUAL

810.502-US-01

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	PROPERTY COUNSEL	ATTORNEY DOCKET NO.
-----------------	-------------	----------------------	------------------	---------------------

39/498,801

01/31/00

BOYD

MAY 29 2001

G

55241USA9A,002

EXAMINER

JANIC2/0522

REFERRED TO

SHAVER, R

Attention William D Miller

Office Of Intellectual Property Counsel

3M Innovative Properties Company

PO BOX 33427

St. Paul MN 55133-3427

ART UNIT

PAPER NUMBER

DUE DATE (S)

DATE MAILED:

ATTORNEY

DOCKETED BY

05/22/01

Restriction Response Due 22 Jun 01

Please find below and/or attached an Office communication concerning this application or proceeding.

6 Mo Restriction Response Due 22 Nov 01

Commissioner of Patents and Trademarks

RECEIVED
APR 17 2003
TC 2800 MAIL ROOM

Office Action Summary

Application No.

09/498,801

Applicant(s)

BOYD ET AL

Examiner

K.D. SIMMONS

Group Art Unit

2872

— The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address —

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 month MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- ☒ Responsive to communication(s) filed on 2/02/00
- ☐ This action is **FINAL**.
- ☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- ☒ Claim(s) 1-35 is/are pending in the application.
- Of the above claim(s) _____ is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☐ Claim(s) _____ is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☒ Claim(s) 1-35 are subject to restriction or election requirement

Application Papers

- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).
- ☐ All ☐ Some* ☐ None of the:
- ☐ Certified copies of the priority documents have been received.
- ☐ Certified copies of the priority documents have been received in Application No. _____.
- ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____

Attachment(s)

- ☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____
- ☐ Interview Summary, PTO-413
- ☐ Notice of Reference(s) Cited, PTO-892
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Other _____

Office Action Summary

Art Unit: 2872

1. This application contains claims directed to the following patentably distinct species of the claimed invention:

- A). The species depicted by Fig. 4;
- B). The species depicted by Fig. 5;
- C). The species depicted by Fig. 9A;
- D). The species depicted by Fig. 9B;
- E). The species depicted by Fig. 9D;
- F). The species depicted by Fig. 9E;
- G). The species depicted by Fig. 9F;
- H). The species depicted by Fig. 9G;
- I). The species depicted by Fig. 11B;
- J). The species depicted by Fig. 12;
- K). The species depicted by Fig. 13; and
- L). The species depicted by Fig. 14B.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, several claims are generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon,

Art Unit: 2872

including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP. § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

2 Applicant is advised that the reply to this requirement to be complete must include an election of the invention to be examined even though the requirement be traversed (37 CFR 1.143).

3 Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(I).

Application/Control Number: 09/498,801

Page 4

Art Unit: 2872

4 Any inquiry concerning this communication should be directed to R.D. Shafer at telephone number (703) 308-4813.

Shafer/tr *MS*

5-11-01

R.D. Shafer
R.D. SHAFER
2872

Appendix 2B

S/N 09/498,801

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	G. Boyd et al.	Examiner:	R. Shafer
Serial No.:	09/498,801	Group Art Unit:	2872
Filed:	1/31/00	Docket No.:	810.502US01
Title:	ILLUMINATION SYSTEM FOR REFLECTIVE DISPLAYS		

CERTIFICATE OF MAILING UNDER 37 C.F.R. §1.8

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, DC 20231 on June 6, 2001.

Iain A. McIntyre

Name

Signature

RESPONSE TO ELECTION REQUIREMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

In the Election Requirement mailed May 22, 2001, the Examiner required election of one of twelve species identified as:

- A) the species depicted by FIG. 4
- B) the species depicted by FIG. 5
- C) the species depicted by FIG. 9A
- D) the species depicted by FIG. 9B
- E) the species depicted by FIG. 9D
- F) the species depicted by FIG. 9E
- G) the species depicted by FIG. 9F
- H) the species depicted by FIG. 9G
- I) the species depicted by FIG. 11B
- J) the species depicted by FIG. 12
- K) the species depicted by FIG. 13 and

L) the species depicted by FIG. 14.

As required by the Examiner, Applicants hereby provisionally elect species E), illustrated in FIG. 9D, with traverse. Claims 1-3, 10-14, 17-21, 26 and 28-35 read on the elected species.

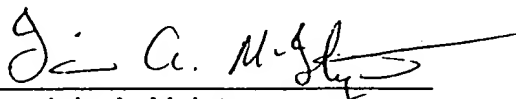
Although Applicants have provisionally elected the species of FIG. 9D, Applicants respectfully request the Examiner to withdraw the Restriction/Election Requirement as to Species A-L, and to proceed with examination of all pending claims 1-35. Applicants respectfully suggest that examination of all pending claims would not be an overburden to the Examiner, given that twenty two of the thirty five pending claims read on the elected species. Examination of all claims at this time would move prosecution of the current application expediently.

If a telephone conference would be helpful in resolving any issues concerning this communication, please contact the below-signed attorney at (952) 912-0571.

Respectfully submitted,

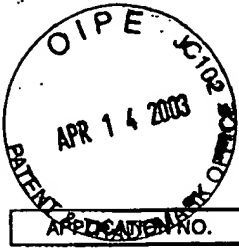
ALTERA LAW GROUP, LLC
6500 City West Parkway, Suite 100
Minneapolis, MN 55344-7701
(952) 912-0523

Dated: 6 June 2001



Iain A. McIntyre
Atty. Reg. Number 40,337

Appendix 2C


**UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office**

 Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
-----------------	-------------	----------------------	---------------------

 OFFICE OF INTELLECTUAL
PROPERTY COUNSEL

3M INNOVATIVE PROPERTIES COMPANY

EXAMINER

AUG 30 2001

ART UNIT

PAPER NUMBER

Application No. 09/122,000
 Office of Intellectual Property Counsel
 3M Innovative Properties Company
 St. Paul, MN 55120-4000
 (612) 592-4000

REFERRED TO

DATE MAILED:

09/27/01

WDM

me

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

RECEIVED

SEP 06 2001

WILLIAM D. MILLER

RECEIVED
 APR 17 2003
 TC 2800 MAIL ROOM

Office Action Summary

Application No.

09/1493,301

Applicant(s)

BOTO ET AL

Examiner

JESSE SHAFER

Group Art Unit

2572

— The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address —

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- ☒ Responsive to communication(s) filed on 6/11/01
- ☐ This action is FINAL.
- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- ☒ Claim(s) 1-35 is/are pending in the application.
- Of the above claim(s) _____ is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☐ Claim(s) _____ is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☒ Claim(s) 1-35 are subject to restriction or election requirement

Application Papers

- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).
- ☐ All ☐ Some* ☐ None of the:
- ☐ Certified copies of the priority documents have been received.
- ☐ Certified copies of the priority documents have been received in Application No. _____
- ☐ Copies of the certified copies of the priority documents have been received

In this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____

Attachment(s)

- ☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____
- ☐ Notice of Reference(s) Cited, PTO-892
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Interview Summary, PTO-413
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Other _____

Office Action Summary

Application/Control Number: 09/498,801

Page 2

Art Unit: 2872

1. The restriction requirement set forth in Paper No. 6 is withdrawn. A corrected restriction requirement follows.
2. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 2-9, drawn to an illuminated display device comprising a first light source, a reflective image display and a reflective polarizing film with particular polarizing film details, classified in class 362, subclass 19.
 - II. Claim 10, drawn to an illuminated display device comprising a first light source, a reflective image display, a reflective polarizing film and a viewing port with particular placement of the polarizing film, classified in class 362, subclass 19.
 - III. Claim 11, drawn to an illuminated display device comprising a first light source, a reflective image display, a reflective polarizing film and a clean-up polarizer, classified in class 362, subclass 19.
 - IV. Claims 12-16, drawn to an illuminated display device comprising a first light source, a reflective image display, a reflective polarizing film and a reflector with or without particular polarizing film details, classified in class 362, subclass 19.
 - V. Claims 17-26, drawn to an illuminated display device comprising a first light source, a reflective image display, a reflective polarizing film and a diffuser, classified in class 362, subclass 19.

Application/Control Number: 09/498,801

Page 3

Art Unit: 2872

- VI. Claim 27, drawn to an illuminated display device comprising a first light source, a reflective image display, a reflective polarizing film and a second light source, classified in class 362, subclass 19.
- VII. Claim 28, drawn to an illuminated display device comprising light generating means for emitting diffuse, polarized light, reflective display means for modulating reflected light with an image and reflective polarizing means, classified in class 359, subclass 247.
- VIII. Claims 29-35, drawn to an illuminated display device comprising a first light source, a reflective image display, a reflective polarizing film and a controller, classified in class 396, subclass 281.
3. Claim 1 link(s) inventions I-VI and VIII. The restriction requirement between the linked inventions is subject to the nonallowance of the linking claim(s), claim 1. Upon the allowance of the linking claim(s), the restriction requirement as to the linked inventions shall be withdrawn and any claim(s) depending from or otherwise including all the limitations of the allowable linking claim(s) will be entitled to examination in the instant application. Applicant(s) are advised that if any such claim(s) depending from or including all the limitations of the allowable linking claim(s) is/are presented in a continuation or divisional application, the claims of the continuation or divisional application may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application. Where a restriction requirement is

Application/Control Number: 09/498,801

Page 4

Art Unit: 2872

withdrawn, the provisions of 35 U.S.C. 121 are no longer applicable. See *In re Ziegler*, 44 F.2d 1211, 1215, 170 USPQ 129, 131-32 (CCPA 1971). See also MPEP § 804.01.

4. The inventions are distinct, each from the other because of the following reasons:

Inventions [II-VI, VIII] and [I, VII] are related as combination and subcombination.

Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because of the omission of the particular polarizing film details or the details of the reflective display means modulates reflected light with an image. The subcombination has separate utility such as an illuminated display device without a viewing port, a clean-up polarizer, a reflector, a second light source or a controller.

Inventions IV and I are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because of omission of the particular polarizing film details. The subcombination has separate utility such as an illuminated display without a reflector.

Application/Control Number: 09/498,801

Page 5

Art Unit: 2872

Inventions II-VI and VIII are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, each of the inventions II-VI and VIII has separate utility such as an illuminated display with the separate details of the other invention(s). For example, the illuminated display of invention II has separate utility as an illuminated display without the clean-up polarizer of invention III, the reflector of invention IV, the diffuser of invention V, the second light source of invention VI or the controller of invention VIII, the illuminated display of invention III has separate utility as an illuminated display without the viewing port of invention II, the reflector of invention IV, the diffuser of invention V, the second light source of invention VI or the controller of invention VIII, ...etc. See MPEP § 806.05(d).

5. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification or recognized divergent subject matter or the search required for one the inventions is not required for any of the remaining inventions as indicated below. Therefore, restriction for examination purposes as indicated as proper.

The search required for invention I would further require a search in class 359, subclass 490 which would not be required for inventions II-VI.

The search required for invention III would further require a search in class 359, subclass 501 which would not be required for inventions I, II, IV, V and VI.

Application/Control Number: 09/498,801

Page 6

Art Unit: 2872

The search required for invention IV would further require a search in class 362, subclass 560 which would not be required for inventions I-III, V and VI.

The search required for invention V would further require a search in class 362, subclass 558 which would not be required for inventions I-IV and VI.

The search required for invention VI would further require a search in class 362, subclass 227 which would not be required for inventions I-V.

6. This application contains claims directed to the following patentably distinct species of the claimed invention:

- A). The species depicted by Fig. 4;
- B). The species depicted by Fig. 5;
- C). The species depicted by Fig. 9A;
- D). The species depicted by Fig. 9B;
- E). The species depicted by Fig. 9D;
- F). The species depicted by Fig. 9E;
- G). The species depicted by Fig. 9F;
- H). The species depicted by Fig. 9G;
- I). The species depicted by Fig. 11B;
- J). The species depicted by Fig. 12;
- K). The species depicted by Fig. 13; and
- L). The species depicted by Fig. 14B.

Application/Control Number: 09/498,801

Page 7

Art Unit: 2872

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species consistent with the elected invention for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, several claims are generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

7. Applicant is advised that the reply to this requirement to be complete must include an election of the invention to be examined even though the requirement be traversed (37 CFR 1.143).

Application/Control Number: 09/498,801

Page 8

Art Unit: 2872

8. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(l).

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to R.D. Shafer whose telephone number is (703) 308-4813.

Shafer/RDS

08/22/2001

R.D. Shafer
2872

Appendix 2D

VUB



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20221
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/498,801	01/31/2000	Gary T. Boyd	55241USA9A-002	9317

810.502 US01

EXAMINER

SHAHER, RICKY D

ART UNIT	PAPER NUMBER
2872	

DATE MAILED: 03/08/2002

Attention William D Miller
Office Of Intellectual Property Counsel
3M Innovative Properties Company
PO BOX 33427
St.Paul, MN 55133-3427

3 month Resp 8 Jun 02
6 month Resp 8 Sept 02
(need new drawings)

Please find below and/or attached an Office communication concerning this application or proceeding.

05/13/02
WDM
pre

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APR 17 2003
TC 2800 MAIL ROOM

Office Action Summary

Application No.

09/498,801

Applicant(s)

BOYD ET AL

Examiner

R.D. SMITH

Group Art Unit

2872

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- ☒ Responsive to communication(s) filed on 10/5/01
- ☐ This action is **FINAL**.
- ☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- ☒ Claim(s) 1-35 is/are pending in the application.
- Of the above claim(s) 10, 11 AND 17-35 is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 1-9 AND 12-16 is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claim(s) _____ are subject to restriction or election requirement

Application Papers

- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☒ The drawing(s) filed on 2/2/00 is/are objected to by the Examiner
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).
- ☐ All ☐ Some* ☐ None of the:
- ☐ Certified copies of the priority documents have been received.
- ☐ Certified copies of the priority documents have been received in Application No. _____.
- ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____

Attachment(s)

- ☒ Information Disclosure Statement(s), PTO-1449, Paper No(s) 2, 3 AND 5
- ☒ Interview Summary, PTO-413, PAPER NO. 9
- ☒ Notice of Reference(s) Cited, PTO-892
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Other _____

Office Action Summary

Art Unit: 2872

1. The restriction requirement mailed 8/27/01 is withdrawn based on an interview with Ms. Cassandra Spyrou, SPE and Mr. Iain A McIntyre, applicant's representative. The following restriction requirement is set forth.

2. Restriction to one of the following inventions is required under 37 USC121:

I. Claims 2-9 and 12-16 are, drawn to an illumination device having specifics of the reflective polarizing film, classified in class 359, subclass 487.

II. Claim 10 and 29-35, drawn to an illumination device having a controller, classified in class 362, subclass 19.

III. Claim 11, drawn to an illumination device having a clean-up polarizer, classified in class 359, subclass 483.

IV. Claims 17-26 and 28, drawn to an illumination device having a diffuser, classified in class 361, subclass 19.

V. Claim 27, drawn to an illumination device having a second light source, classified in class 362, subclass 19.

3. Claim 1 link(s) inventions I-IV and V. The restriction requirement among the linked inventions is subject to the nonallowance of the linking claim(s), claim 1. Upon the allowance of the linking claim(s), the restriction requirement as to the linked inventions shall be withdrawn and any claim(s) depending from or otherwise including all the limitations of the allowable linking claim(s) will be entitled to examination in the instant application. Applicant(s) are advised that if any such claim(s) depending from or including all the limitations of the allowable linking claim(s)

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is/are presented in a continuation or divisional application, the claims of the continuation or divisional application may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application. Where a restriction requirement is withdrawn, the provisions of 35 U.S.C. 121 are no longer applicable. *In re Ziegler*, 44 F.2d 1211, 1215, 170 USPQ 129, 131-32 (CCPA 1971). See also MPEP § 804.01.

4. The inventions are distinct, each from the other because of the following reasons: Inventions I-IV and V are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, inventions I through V have separate utility such as an illumination device in combination with the particulars of the other subcombinations as set forth above in the grouping of claims. See MPEP 806.05(d).

5. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter and the search required for one of the Groups I-V, respectively, is not required for any other of the remaining Groups I-V, respectively, restriction for examination purposes as indicated is proper.

6. During a telephone conversation between Cassandra Spyrou, SPE and Iain McIntyre, applicant's Representative on October 5, 2001, a provisional election was made with traverse to prosecute the invention of Group I, claims 2-9 and 12-16. Affirmation of this election must be made by applicant in replying to this Office action. Claims 10, 11 and 17-35 are withdrawn from

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further consideration by the examiner, 37 CFR1.142(b), as being drawn to a non-elected invention.

7. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventionship must be amended in compliance with 37 CFR1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventionship must be accompanied by a petition under 37 CFR1.48(b) and by the fee required under 37 CFR1.17(I).

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

Claims 1, 12 and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Handschy et al ('451).

Handschy et al discloses a display device comprising a first light source (34), a reflective image display (36), a reflective polarizing film (64) and a reflector (42). Note by example only Fig. 2B.

9. Claims 1 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Minoura et al ('636).

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Minoura et al discloses a display device comprising a first light source (2041), a reflective image display (2051R or 2051B), a reflective polarizing film (2046) and a reflector (2049 and/or 2050). Note by example only Fig. 20.

10. Claims 1 and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Schehrer et al ('246).

Schehrer et al discloses a display device comprising a first light source (501 or 510), a reflective image display (504), a reflective polarizing film (505) and a reflector (502 or 512), note by example only figures 7 and 8.

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Handschy et al ('451) in view of Handschy et al ('800).

Handschy et al ('451) discloses all of the subject matter claimed, note the above explanation, except for the reflective polarizer being curved.

Handschy et al ('800) teaches it is known to provide a curved reflective polarizer in the same field or endeavor for the purpose of reducing the bulk and weight of a display system.

Therefore, it would have been obvious and/or within the level of one of ordinary skill in the art at the time the invention was made to modify the reflective polarizer (polarizing beam

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splitting cube) of Handschy et al ('451) to include a curved reflective polarizer as taught by Handschy et al ('800) in order to reduce the bulk and weight of the display system.

12. Claims 2-9 and 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Minoura et al ('636) or Schehrer et al ('246).

Minoura et al and Schehrer et al each disclose all of the subject matter claimed, note the above explanation, except for the reflective polarizing film being curved.

It is well known to provide a curved reflective polarizer in the same field of endeavor or analogous art for the purpose of reducing the bulk and weight of a display system or alternating provide for light concentration, uniform light transmission and/or aberration corrections.

Therefore, it would have been obvious and/or within the level of one of ordinary skilled In the art at the time the invention was made to modify the polarizing beam splitter of Minoura et al or Schehrer et al to include a curved reflective polarizer as is common used and employed in the optical art in order to increase light concentration, provide uniform light transmission or alternatively reduce optical aberrations, bulk and weight of the display system.

13. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the first portion of the reflective polarizing film being displaced from the light source along the first axis and the second portion of the reflective polarizing film being displaced from the first light source along the optical axis must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Serial Number: 09/498,801

Page 7

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14. Any inquiry concerning this communication should be directed to R. D. Shafer at telephone number (703) 308-4813.

Shafer/ds

02/03/02

R. D. Shafer
2872



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

SERIAL NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKETT NO.
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EXAMINER

ART UNIT	PAPER NUMBER
----------	--------------

DATE MAILED:

EXAMINER INTERVIEW SUMMARY RECORD

All participants (applicant, applicant's representative, PTO personnel):

(1) MR. IAIN A MCINTYRE (3) _____

(2) RD. SHAFER (4) _____

Date of interview 9/25/01

Type: ☒ Telephonic ☐ Personal (copy is given to ☐ applicant ☐ applicant's representative).

Exhibit shown or demonstration conducted: ☐ Yes ☐ No. If yes, brief description: _____

Agreement ☐ was reached with respect to some or all of the claims in question. ☒ was not reached.

Claims discussed: N/A

Identification of prior art discussed: N/A

Description of the general nature of what was agreed to if an agreement was reached, or any other comments: _____

SEE ATTACHMENT

(A fuller description, if necessary, and a copy of the amendments, if available, which the examiner agreed would render the claims allowable must be attached. Also, where no copy of the amendments which would render the claims allowable is available, a summary thereof must be attached.)

☒ 1. It is not necessary for applicant to provide a separate record of the substance of the interview.

Unless the paragraph below has been checked to indicate to the contrary, A FORMAL WRITTEN RESPONSE TO THE LAST OFFICE ACTION IS NOT WAIVED AND MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW (e.g., items 1-7 on the reverse side of this form). If a response to the last Office action has already been filed, then applicant is given one month from this interview date to provide a statement of the substance of the interview.

- ☐ 2. Since the examiner's interview summary above (including any attachments) reflects a complete response to each of the objections, rejections and requirements that may be present in the last Office action, and since the claims are now allowable, this completed form is considered to fulfill the response requirements of the last Office action. Applicant is not relieved from providing a separate record of the substance of the interview unless box 1 above is also checked.

Art Unit: 2872

1. During the interview applicant's representative argued that he was confused as to how dependent claims can be properly restricted from an independent claim. The examiner pointed out to applicant's representative that the standard for restriction is that the examiner is required (1) to determine patentable distinctness, as set forth in MPEP section 806.05(c); (2) to satisfy the objective standard of separate status in the art, as set forth in MPEP section 808.02; and (3) to use his/her best judgement concerning burden with regard to Search and Examination, as set forth in MPEP section 803, which have been clearly addressed in this application.

The examiner referred applicant's representative to Paper No. 8, which clearly demonstrates the distinctness and burden between each of the patentably distinct inventions. The examiner informed applicant's representative may overcome the requirement for restriction by presenting an allowable linking claim as set forth in MPEP 809.04 or by providing a clear admission on the record that the claim(s) drawn to a given non-elected invention is not patentably distinct from the elected invention as set forth in MPEP 803.

The examiner further informed applicant's representative that he is required to elected a single invention and species to be fully responsive to the prior office action and to provide any arguments as why he considers the claim(s) drawn to a given non-elected invention not patentably distinct from the elected invention.

2. Any inquiry concerning this communication should be directed to R.D. Shafer at telephone number (703) 308-4813.

September 25, 2001/RDS

R.D. Shafer
e f s 72

Notice of References Cited

Application No.

09/495,804

Applicant(s)

BOTO ET AL

Examiner

R D SHARON

Group Art Unit

2572

Page

1 of 1

U.S. PATENT DOCUMENTS

*	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS
A	2,642,487	6-1953	SCHROEDER		
B	4,402,269	3-1995	YONO ET AL		
C	5,996,451	1-1997	HANDSCHY ET AL		
D	5,826,960	10-1998	GOTON ET AL		
E	6,072,625	6-2000	HASHIZUME ET AL		
F	6,256,151	7-2001	MA ET AL		
G	6,282,029	8-2001	MA ET AL		
H					
I					
J					
K					
L					
M					

FOREIGN PATENT DOCUMENTS

	DOCUMENT NO.	DATE	COUNTRY	NAME	CLASS	SUBCLASS
N						
O						
P						
Q						
R						
S						
T						

NON-PATENT DOCUMENTS

*	DOCUMENT (including Author, Title, Source, and Pertinent Pages)	DATE
U		
V		
W		
X		

A copy of this reference is not being furnished with this Office action.
(See Manual of Patent Examining Procedure, Section 707.05(3).)

Appendix 2E



S/N 09/498,801

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Boyd et al.	Examiner:	Shafer, Ricky D.
Serial No.:	09/498,801	Group Art Unit:	2872
Filed:	1/31/00	Docket No.:	810.502US01
Title:	ILLUMINATION SYSTEM FOR REFLECTIVE DISPLAYS		

CERTIFICATE UNDER 37 C.F.R. 1.10:

'Express Mail' mailing number: EL887039830US

Date of Deposit: June 13, 2002

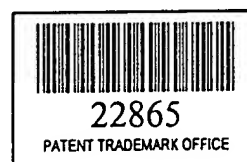
The undersigned hereby certifies that this Transmittal Letter and the paper or fee, as described herein, are being deposited with the United States Postal Service 'Express Mail Post Office To Addressee' service under 37 CFR 1.10 and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

By: Lee Thao

Lee Thao

Amendment and Response Under 37 C.F.R. §1.111

Assistant Commissioner for Patents
Washington, D.C. 20231



Dear Sir:

This paper is submitted in response to the Office Action dated March 8, 2002, setting a three month shortened statutory period for response.

Claims 1-35 are pending in the application. Reconsideration and allowance of the pending claims of the application are respectfully requested, in view of the following amendments and remarks.

IN THE CLAIMS

Claims 1-38 are pending. Claims 10, 11 and 17-35 have been withdrawn from consideration. New claims 36-38 have been added. A clean copy of the new and amended claims is included below. A marked up copy of the entire set of claims is included in Appendix A.

Kindly amend claims 1 and 6 as follows.

1. (once amended) An illuminated display device, comprising:

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a first light source disposed on a mount having a mount surface and directing light generally along a first axis;

a reflective image display unit disposed on the mount surface with an optical axis substantially parallel to the first axis; and

a reflective polarizing film disposed to direct light from the first light source to the reflective image light display unit.

6. (amended) A device as recited in claim 2, wherein a first portion of the reflective polarizing film is displaced from the first light source along the first axis and a second portion of the reflective polarizing film is displaced from the reflective image display unit along the optical axis.

Kindly add new claims 36-38 as follows.

36. (new) A device as recited in claim 1, wherein the first light source and the reflective image display are disposed on the mount surface in a coplanar manner.

37. (new) A device as recited in claim 1, wherein the mount is a substrate common to the first light source and the reflective image display.

38. (new) A device as recited in claim 1, wherein the first light source and reflective image display are mounted side by side on the mount surface.

REMARKS

Claims 1-9, 12-16, and 36-38 are under consideration in the pending in the patent application. Claims 10, 11 and 17-35 have been withdrawn from consideration. Claims 1 and 6 have been amended. New claims 36-38 are added. No new matter has been added.

Applicants confirm the election of Group I, claims 2-9 and 12-16, made provisionally during a telephone conversation between Ms. Cassandra Spyrou and the below-signed attorney on October 5, 2001.

Applicants note that the drawings were objected to under 37 C.F.R. §1.83(a) as failing to show every feature of the invention as specified in the claims. In particular, it was stated that the first portion of the polarizing film being displaced from the light source along the first axis and the second portion of the reflective polarizing film being displaced from the first light source along the optical axis should be shown in a drawing or canceled from the claims. Claim 6 has been amended to indicate that the second portion of the reflective polarizing film is displaced from the reflective imaging display unit along the optical axis.

Claims 1, 12, and 13 are rejected under 35 U.S.C. §102 (b) as being anticipated by Handschy et al (U.S. Patent No. 5,596,451) (Handschy '451). Claims 1 and 12 are rejected under 35 U.S.C. §102 (b) as being anticipated Minoura et al. (EPO #0 492 636) (Minoura). Claims 1 and 12 are rejected under 35 U.S.C. §102 (e) as being anticipated by Schehrer et al (PCT Publication No. 99/34246).

The rejection under Schehrer is improper. The present application was filed before November 29, 2000, and was not voluntarily published, therefore the pre-AIPA (American Inventors Protection Act) version of 35 U.S.C. § 102(e) applies. See, for example, "Examination Guidelines for 35 U.S.C 102(e)(2) as amended by the American Inventors Protection Act of 1999", 1243 OG 1037. According to the pre-AIPA version of 35 U.S.C. § 102(e), only a US patent application that issues as a patent may be used as prior art. Schehrer is not a US patent application and has not issued as a US patent. Instead, Schehrer is a PCT publication and is, therefore, inapplicable as a reference under the pre-AIPA 35 U.S.C. § 102(e). Therefore, the rejection under Schehrer is improper. Applicants respectfully request that this rejection be withdrawn.

Handschy '451 teaches a projection system having an illumination arrangement (34) that directs light into a polarization cube (48). The light passes through the cube to a spatial light modulator (36) which is located on the other side of the cube from the illumination arrangement. Image light reflected by the spatial light modulator is deflected by the cube to a mirror (42). The image light also double-passes a quarter-wave plate so that the image light reflected by the mirror is directed through the cube to the viewer (24).

Minoura teaches a system having a light source (2041) that directs light to a polarization beamsplitter (2046). The polarization beamsplitter directs light to a cross dichroic prism 2048 that splits the incoming light into red green and blue bands, each of which is directed to a respective reflection liquid crystal panel (2051). The panels impose an image on the incident light by spatially modulating the polarization of the incident light. The light in the different color bands is recombined at the cross dichroic prism and then is transmitted through the polarization beamsplitter to a projection lens 2052.

The invention of amended claim 1 is directed to an illuminated display device, that has a first light source disposed on a mount having a mount surface. The first light source directs light generally along a first axis. A reflective image display unit is disposed on the mount surface with an optical axis substantially parallel to the first axis. A reflective polarizing film is disposed to direct light from the first light source to the reflective image light display unit.

To anticipate a claim, the reference must teach every element of the claim. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Therefore, all claim elements, and their limitations, must be found in the prior art reference to maintain a rejection based on 35 U.S.C. §102. Applicants respectfully submit that neither reference teaches all the elements of claim 1, and therefore each reference fails to anticipate claim 1.

In particular, neither reference teaches that the first light source and the reflective image display unit are mounted on the first surface of the mount. Such an arrangement permits the light source and image display unit to sit side by side on the same board or substrate, as is described in the present Specification at page 7, line 31 - page 8, line 9.

On the other hand, Handschy '451 teaches a light source that is disposed on one side of a polarization splitting cube and a liquid crystal panel on the other side of

the polarization splitting cube. Clearly, such an arrangement does not permit the light source and the reflective image display unit to both be mounted on the same surface.

In addition, Minoura shows a reflective display unit that is separate from the light source, and is silent about mounting the two on the same surface.

Accordingly, since neither reference teaches all the elements of claim 1, claim 1 is not anticipated by the prior art.

Dependent claims 12 and 13, which depend from claim 1 and further define the invention of claim 1, were also rejected as being anticipated by Handschy '451 and claim 12 was rejected as being anticipated by Minoura. While Applicants do not acquiesce with the particular rejections to these dependent claims, it is believed that these rejections are moot in view of the remarks made in connection with independent claim 1. Therefore, dependent claims 12 and 13 are also in condition for allowance.

Claim 12 is directed to a reflector disposed to direct light from the first light source to the reflective polarizing film layer. Claim 13, which depends from claim 12, is directed to at least one of the reflector and the reflective polarizing film being curved at least one dimension to form a curved reflector.

It is stated in the Office Action that Handschy teaches the reflector as element (42). In fact, Handschy fails to teach the reflector disposed to direct light from the first light source to the reflective polarizing film layer. Instead, Handschy's light source (36) illuminates the reflective polarizer directly, without any intervening reflector. Handschy's reflector directs light that has passed through the reflective polarizer, back to the reflective polarizer. Accordingly, Handschy fails to teach the elements of claim 12.

Minoura teaches a reflector that reflects light to the reflective polarizer, which reflects light to the reflective image light display. In the Office Action, it is stated that the reflector is element (2049) or element (2050). However, elements 2049 and 2050 are color reflecting surfaces that are used to separate the light into different colors before being incident on the image display units (2051R, 2051G and 2051B). These reflecting surfaces are not, however, disposed to reflect light from the light source to the polarizing beamsplitter. Instead, they reflect light from the polarizing beamsplitter to the image display unit, and from the image display unit back to the polarizing

beamsplitter. Accordingly, the reflectors (2049 and 2050) cannot be considered to be the reflector of claim 12.

Another reflector (2042) is illustrated in FIG. 20. This reflector is used to collect the light from the light source 2041. However, the light that propagates along the axis from the light source is not reflected by the reflector (2042). That light that is reflected by the reflector (2042) is not projected along the axis of the light source. Accordingly, the reflector (2042) cannot be considered to be the reflector of claim 12.

Thus, neither Minoura or Handschy '451 teach the reflector of claim 12, and claim 12 is not anticipated.

Regarding claim 13, it was noted with regard to claim 12 that Handschy's reflector (42) could not be considered to be the reflector of claim 12. Handschy's reflector (42) appears to be curved, but Handschy '451 does not teach the use of a curved reflector between the light source and the reflective polarizer, nor a curved reflective polarizer. Accordingly, claim 13 is not anticipated by Handschy '451.

Claim 2 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Handschy '451 in view of Handschy et al. (U.S. Patent No. 5,808,800) (Handschy '800). It is stated in the Office Action that Handschy '451 does not teach a curved reflective polarizer, but that Handschy '800 teaches that it is known to provide a curved reflective polarizer for reducing the bulk and weight of a display system.

Three criteria must be met to establish a *prima facie* case of obviousness. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference. Second, there must be a reasonable expectation of success. Finally, the prior art reference, or combination of references, must teach or suggest all the claim limitations. MPEP § 2142. Applicants respectfully traverse the rejection since the prior art fails to disclose all the claim limitations.

Handschy '800 fails to rectify the deficiency of Handschy '451 discussed above, and does not teach or suggest a first light source disposed on a mount surface and directing light generally along a first axis, and a reflective image display unit disposed on the mount surface with an optical axis substantially parallel to the first axis.

Accordingly, the proposed combination of references fails to teach or suggest all the limitations of claim 2, and claim 2 is not obvious in view of the proposed combination of references, and is patentable.

Claims 2-9 and 13-16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Minoura or Schehrer. Schehrer is an improper reference, as is discussed above. It is stated in the Office Action that Minoura teaches all the subject matter claimed except for the curved polarizing beamsplitter. It is also stated that use of a curved polarizing beamsplitter was known and that it would have been obvious for one of ordinary skill in the art to use a curved polarizing beamsplitter for the purpose of reducing the bulk and weight of a display system, or to provide for light concentration, uniform light transmission and/or aberration correction. In an earlier rejection, the Examiner relies on Handschy '800 as evidence that it was known to use a curved polarizing beamsplitter. No other evidence is provided in the Office Action to support the assertion that it was known to use a curved polarizing beamsplitter, and so this rejection is understood to be based on the combination of Minoura and Handschy '800.

Claims 2-9 and 13-16 depend from, and further define, allowable claim 1. Accordingly, claims 2-9 and 13-16 are also allowable over Minoura.

Regarding claim 4, Handschy '800 only shows a curved polarizing beamsplitter that is curved in one plane, the plane of the device. Handschy '800 does not teach or suggest that the beamsplitter is curved in the plane out of the figure. Accordingly, The proposed modification of Minoura fails to teach or suggest with a radius of curvature lying parallel to a plane formed by the first axis and an axis orthogonal to both the first axis and the displacement direction. Thus, the cited art fails to teach or suggest all the elements of claim 4.

Regarding claim 5, the cited art fails to teach or suggest that the curved polarizer is curved in two directions. In particular, the cited art fails to teach or suggest a reflective polarizing film that is curved with a first radius of curvature lying in a first plane and with a second radius of curvature lying in a second plane perpendicular to the first plane. Accordingly, claim 5 is not obvious in view of the cited art.

Regarding claim 6, Minoura fails to teach or suggest a first portion of the reflective polarizing film being displaced from the first light source along the first axis and a second portion of the reflective polarizing film being displaced from the reflective image display unit along the optical axis, where the first axis and the optical axis are parallel. Therefore, claim 6 is not obvious in view of the cited art.

It follows from the lack of teaching of the elements of claim 7 that claims 7-9, which further define the first and second portions of the reflecting polarizer, that the elements of these claims are likewise not taught or suggested by the cited art.

Regarding claim 13, it was stated above, with reference to claim 12, that Minoura fails to teach a reflector disposed to direct light from the first light source to the reflective polarizing film layer. Claim 13 depends from claim 12, and so the proposed combination of references fails to teach or suggest a reflector as claimed in claim 13. Accordingly, the cited art also fails to teach or suggest all the elements of claim 13, and claim 13 is not obvious in view of the cited art.

Claims 14-16 depend from claim 13, which is allowable, and further define the reflective polarizer. As was discussed above with respect to claims 4 and 5, the cited art fails to teach that the polarizing beamsplitter is curved with a radius of curvature out of the plane of the Handschy '800's Figure 11. Accordingly, the cited art fails to teach or suggest the elements of claims 15 and 16. Accordingly, claims 14-16 are also allowable.

New claims 36-38 have been added. these claims fall within the elected invention. No new matter has been introduced, and these claims are supported by the disclosure. For example, at the very least, claims 36 and 38 are supported by Figures 12 and 13, and claim 37 is supported by the disclosure at page 2, lines 2-3.

In view of the amendments and reasons provided above, it is believed that all pending claims are in condition for allowance. Applicant respectfully requests favorable reconsideration and early allowance of all pending claims.

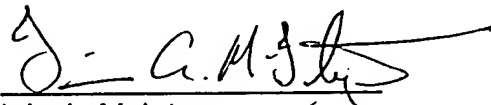
If a telephone conference would be helpful in resolving any issues concerning this communication, please contact Applicant's attorney of record, Iain A. McIntyre at 952-253-4110.

Respectfully submitted,

Altera Law Group, LLC
6500 City West Parkway, Suite 100
Minneapolis, MN 55344
(952)-253-4110

Date: June 13, 2002

By:


Iain A. McIntyre
Reg. No. 40,337
IAM/blj

Appendix A
Marked Up Version of the Entire Claim Set Currently Being Considered

1. (once amended) An illuminated display device, comprising:
a first light source disposed on a mount having a mount surface and directing light generally along a first axis;
a reflective image display unit disposed on the mount surface with an optical axis substantially parallel to the first axis; and
a reflective polarizing film disposed to direct light from the first light source to the reflective image light display unit.
2. (unchanged) A device as recited in claim 1, wherein the reflective polarizing film is curved in at least one dimension.
3. (unchanged) A device as recited in claim 2, wherein the optical axis of the reflective image display unit is laterally displaced from the first axis in a displacement direction and the reflective polarizing film is curved with a radius of curvature lying parallel to a plane formed by the first axis and the displacement direction.
4. (unchanged) A device as recited in claim 2, wherein the optical axis of the reflective image display unit is laterally displaced from the first axis in a displacement direction and the reflective polarizing film is curved with a radius of curvature lying parallel to a plane formed by the first axis and an axis orthogonal to both the first axis and the displacement direction.
5. (unchanged) A device as recited in claim 2, wherein the optical axis of the reflective image display unit is laterally displaced from the first axis in a displacement direction and the reflective polarizing film is curved with a first radius of curvature lying parallel to a plane formed by the first axis and the displacement direction and is curved with a second radius of curvature lying parallel to a plane

formed by the first axis and an axis orthogonal to both the first axis and the displacement direction.

6. (amended) A device as recited in claim 2, wherein a first portion of the reflective polarizing film is displaced from the first light source along the first axis and a second portion of the reflective polarizing film is displaced from the [first light source] reflective image display unit along the optical axis.

7. (unchanged) A device as recited in claim 6, wherein the first portion of the reflective polarizing film is curved.

8. (unchanged) A device as recited in claim 6, wherein the second portion of the reflective polarizing film is curved.

9. (unchanged) A device as recited in claim 6, wherein both the first and second portions of the reflective polarizing film are curved.

12. (unchanged) A device as recited in claim 1, further comprising a reflector disposed to direct light from the first light source to the reflective polarizing film layer.

13. (unchanged) A device as recited in claim 12, wherein at least one of the reflector and the reflective polarizing film is curved in at least one dimension to form a curved reflector.

14. (unchanged) A device as recited in claim 13, wherein the optical axis of the reflective image display unit is laterally displaced from the first axis in a displacement direction and the reflective polarizing film is curved with a radius of curvature lying parallel to a plane formed by the first axis and the displacement direction.

15. (unchanged) A device as recited in claim 13, wherein the optical axis of the reflective image display unit is laterally displaced from the first axis in a displacement direction and the reflective polarizing film is curved with a radius of curvature lying parallel to a plane formed by the first axis and an axis orthogonal to both the first axis and the displacement direction.

16. (unchanged) A device as recited in claim 13, wherein the optical axis of the reflective image display unit is laterally displaced from the first axis in a displacement direction and the reflective polarizing film is curved with a radius of curvature lying parallel to a plane formed by the first axis and the displacement direction and is curved with another radius of curvature lying parallel to a plane formed by the first axis and an axis orthogonal to both the first axis and the displacement direction.

36. (new) A device as recited in claim 1, wherein the first light source and the reflective image display are disposed on the mount surface in a coplanar manner.

37. (new) A device as recited in claim 1, wherein the mount is a substrate common to the first light source and the reflective image display.

38. (new) A device as recited in claim 1, wherein the first light source and reflective image display are mounted side by side on the mount surface.

Appendix 2F



UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/498,801	01/31/2000	Gary T. Boyd	55241USA9A	9317

7590 09/12/2002

Attention William D Miller
Office Of Intellectual Property Counsel
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St. Paul, MN 55133-3427

OFFICE OF INTELLECTUAL
PROPERTY COUNSEL
3M INNOVATIVE PROPERTIES COMPANY

EXAMINER

SHAHER, RICKY D

ART UNIT	PAPER NUMBER
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2872

DATE MAILED: 09/12/2002

12/12/02
3/12/03
SEP 17 2002
REGISTERED BY
REFERRED TO

Please find below and/or attached an Office communication concerning this application or proceeding.

2 month FR 12 NOV 02
6 month FR 12 MAR 03

RECEIVED
APR 17 2003
TC 2900 MAIL ROOM

RECEIVED

SEP 18 2002

WILLIAM D. MILLER

SEP 30 2002

Office Action Summary

Application No.

09/498,801

Applicant(s)

BOYD ET AL

Examiner

R.D. SHAFER

Group Art Unit

2872

— The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address —

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- ☒ Responsive to communication(s) filed on 6/13/02
- ☒ This action is **FINAL**.
- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- ☒ Claim(s) 1-9, 12-16 AND 36-38 is/are pending in the application.
- Of the above claim(s) 36-38 is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 1-9 AND 12-16 is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claim(s) _____ are subject to restriction or election requirement

Application Papers

- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).
- ☐ All ☐ Some* ☐ None of the:
- ☐ Certified copies of the priority documents have been received.
- ☐ Certified copies of the priority documents have been received in Application No. _____.
- ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))
- *Certified copies not received: _____

Attachment(s)

- ☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____
- ☒ Notice of Reference(s) Cited, PTO-892
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Interview Summary, PTO-413
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Other _____

Office Action Summary

Art Unit: 2872

1. Newly submitted claims 36-38 are directed to an invention that is independent or distinct from the elected invention for the following reasons. Newly submitted claims 36-38 are not drawn to the elected invention because the newly submitted claims fail to include the particular and/or specific details of the reflective polarizing film and adds separate details of the mounting arrangement of the first light source and the reflective image being coplanar or side by side. The newly submitted and elected inventions are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because of the omission of the particular and/or specific details of the reflective polarizing film, as evidenced by original and/or amended claim 1. The subcombination has separate utility such as an illuminated display device without the particular mounting arrangement of the first light source and the reflective image being coplanar or side by side which would required a search in class 345 subclass 8 which would not be required for the elected invention. Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 36-38 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Art Unit: 2872

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

3. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Uchiyama et al ('032).

Uchiyama et al discloses an illuminated display device comprising a first light source (2) disposed on a mount (10) having a mounting surface and directing light along a first axis, a reflective image display unit [(6B) or (6R)] disposed on the mount surface with an optical axis substantially parallel to the first axis and a reflective polarizing film (4) disposed to direct light from the first light source to the reflective image display unit. Note Figures 2 and 16.

4. Claims 1 and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Schehrer et al ('508).

Art Unit: 2872

Schehrer et al discloses an illuminated display device comprising a first light source [(501), (510) or (533)] disposed on a mount (534) having a mounting surface and directing light along a first axis, a reflective image display (504) disposed on the mount surface with an optical axis substantially parallel to the first axis, a reflective polarizing film (505) and a reflector [(502), (512) (532)]. Note figures 1A, 7, 8 and 10a to 10d.

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Handschy et al ('451).

Handschy et al discloses an illuminated display device comprising a first light source (34), a reflective image display (36), a reflective polarizing film (64) and a reflector (42), note Figure 2B, except for explicitly illustrating that the illuminated display device includes a mount having a mounting surface.

However, it would have been obvious and/or within the level of one of ordinary skill in the art at the time the invention was made that each of the elements of the illuminated display device of Handschy et al would include a supporting substrate and it would have been obvious to mount the elements on the same supporting substrate in order to maintain better optical alignment when said display device is mounted onto a helmet or a pair of glasses.

Art Unit: 2872

7. Claims 2-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uchiyama et al ('032).

Uchiyama et al discloses all of the subject matter claimed, note the above explanation, except for the reflective polarizing film being curved.

It is well known to provide a curved reflective polarizer in the same field of endeavor or analogous art for the purpose of reducing the bulk and weight of a display system or alternating provide for light concentration, uniform light transmission and/or aberration corrections.

Therefore, it would have been obvious and/or within the level of one of ordinary skilled in the art at the time the invention was made to modify the polarizing beam splitter of Uchiyama et al to include a curved reflective polarizer as is common used and employed in the optical art in order to increase light concentration, provide uniform light transmission or alternatively reduce optical aberrations, bulk and weight of the display system.

8. Claims 2-9 and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Handschy et al ('451) in view of Handschy et al ('800).

Handschy et al ('451) discloses all of the subject matter claimed, note the above explanation, except for the reflective polarizer being curved.

Handschy et al ('800) teaches it is known to provide a curved reflective polarizer in the same field or endeavor for the purpose of reducing the bulk and weight of a display system.

Therefore, it would have been obvious and/or within the level of one of ordinary skill in the art at the time the invention was made to modify the reflective polarizer (polarizing beam

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splitting cube) of Handschy et al ('451) to include a curved reflective polarizer as taught by Handschy et al ('800) in order to reduce the bulk and weight of the display system.

9. Claims 2-9 and 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schehrer et al ('508).

Schehrer et al discloses all of the subject matter claimed, note the above explanation, except for the reflective polarizing film being curved.

It is well known to provide a curved reflective polarizer in the same field of endeavor or analogous art for the purpose of reducing the bulk and weight of a display system or alternating provide for light concentration, uniform light transmission and/or aberration corrections.

Therefore, it would have been obvious and/or within the level of one of ordinary skilled in the art at the time the invention was made to modify the polarizing beam splitter of Schehrer et al to include a curved reflective polarizer as is common used and employed in the optical art in order to increase light concentration, provide uniform light transmission or alternatively reduce optical aberrations, bulk and weight of the display system.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after

Art Unit: 2872

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication should be directed to R. D. Shafer at telephone number (703) 308-4813.

RDS

September 7, 2002

Rail D. Shafer
RICHARD D. SHAFER
ATTORNEY
ART UNIT 2872

Notice of References Cited

Application No. 09/498,801	Applicant(s) BUYO ET AL
Examiner R.D. SHAFER	Group Art Unit 2872
Page 1 of 1	

U.S. PATENT DOCUMENTS

* A	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS
A	5,382,987	1-1995	SPEERLING		
B	5,605,390	2-1997	BRECE ET AL		
C	5,676,442	10-1997	FUJIMORI		
D	5,800,032	9-1998	UCHIYAMA ET AL		
E	5,853,240	12-1998	TANAKA ET AL		
F	5,943,171	8-1999	BUOD ET AL		
G	US 2002/0003508A1	1-2002	SCHERZER ET AL		
H					
I					
J					
K					
L					
M					

FOREIGN PATENT DOCUMENTS

* N	DOCUMENT NO.	DATE	COUNTRY	NAME	CLASS	SUBCLASS
N						
O						
P						
Q						
R						
S						
T						

NON-PATENT DOCUMENTS

* U	DOCUMENT (Including Author, Title, Source, and Pertinent Pages)	DATE
U		
V		
W		
X		

* A copy of this reference is not being furnished with this Office action.
(See Manual of Patent Examining Procedure, Section 707.05(a).)

Appendix 2G



S/N 09/498801

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	BOYD et al.	Examiner:	Shafer, Ricky
Serial No.:	09/498801	Group Art Unit:	2872
Filed:	1/31/00	Docket No.:	55241US002
Title:	ILLUMINATION SYSTEM FOR REFLECTIVE DISPLAYS		

CERTIFICATE UNDER 37 C.F.R. 1.8: The undersigned hereby certifies that this Transmittal Letter and the paper, as described herein, are being deposited in the United States Postal Service, as first class mail, with sufficient postage, in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231 on December 12, 2002.

Iain A. McIntyre
Name

J. A. McIntyre
Signature

Amendment and Response Under 37 C.F.R. §1.116

Box AF
Assistant Commissioner for Patents
Washington, D.C. 20231



Dear Sir:

This paper is submitted in response to the Final Rejection dated September 12, 2002, setting a three month shortened statutory period for response.

IN THE CLAIMS

Kindly amend claim 12 as shown.

12. (once amended) A device as recited in claim 1, further comprising a reflector disposed to direct light from the first light source to the reflective polarizing film.

Page 1
3M# 55241US002
ALG Number: 810.502US01
Office Action Response

IC 2800 MAIL ROOM

APR 17 2003

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REMARKS

Claims 1-9 and 12-16 are pending in the application. Claims 10, 11, and 17-38 have been withdrawn from consideration. Claim 12 has been amended to clarify the claimed subject matter. The amendment to claim 12 was not made in response to a rejection of patentability and does not narrow the scope of the claim. No new matter has been added. Reexamination and reconsideration of the claims as requested is respectfully requested.

Claims 36-38 have been withdrawn from consideration by the Examiner. Applicants respectfully traverse this withdrawal.

Claim 1 is rejected under 35 U.S.C. §102 (b) as being anticipated by Uchiyama et al. (US Patent No. 5,800,032) (Uchiyama). Uchiyama teaches, for example as disclosed in FIGs. 2 and 16, a projection system that has a light source (2) is fixed to a fixing member (8) that is mounted on the upper, inside surface of a case (1). Light from the light source passes into a polarized beam splitter (4), which directs the light to a cross dichroic mirror (5). The dichroic mirror separates the incoming light into three different color bands, blue, green and red, and directs each color band to respective light modulation elements (6B, 6G and 6R). The cross dichroic mirror, the polarized beam splitter and the modulation elements are supported on a frame (9) within the case (col. 1, line 65 – col. 2, line 3).

The light modulation elements spatially modulate the light, which is then reflected and combined in the dichroic mirror. The modulated light passes through the polarized beam splitter to the projection optical system (7), which transmits the image to a projection screen. The projector system is placed on a desk or special stand (10) and the height of the case on the stand is adjustable via the use of height adjusting mechanisms (13) (col. 2, lines 4-18).

The invention of claim 1 is directed to an illuminated display device that includes a first light source disposed on a mount having a mount surface. The first light source directs light generally along a first axis. A reflective image display unit is disposed on the mount surface with an optical axis substantially parallel to the first

axis. A reflective polarizing film is disposed to direct light from the first light source to the reflective image light display unit.

To anticipate a claim, the reference must teach every element of the claim. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628,631, 2 USPQ2d 1051 1053 (Fed. Cir.) 1987). "The identical invention must be shown in as complete detail as is contained in the...claim." Richardson v. Suzuki Motor Co., 868 F. 2d1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Therefore, if a reference does not teach every element of the claim, then the reference does not anticipate the claim (see MPEP § 2131).

Uchiyama fails to teach all the elements of claim 1. According to claim 1, the first light source and the reflective image display unit are both mounted to the mount surface of the mount. Uchiyama fails to teach this arrangement of components. Instead, Uchiyama teaches, in FIGs. 2 and 16, that the light source is mounted to a fixing member that is suspended from the upper surface of the projector casing. The blue spatial light modulator is mounted to the cross-dichroic mirror and the red spatial light modulator is mounted between the cross dichroic mirror and the frame. Neither of the red or blue modulators are mounted to the fixing member nor is the light source mounted to the mounting surface of the frame. Accordingly, Uchiyama fails to teach that the first light source and the image display unit are mounted on the same surface.

It is stated in the Office Action that Uchiyama's desk or stand (10) may be taken as being the mount of claim 1. Applicants respectfully disagree with such a characterization of the reference. The light source is not mounted to the desk's surface, but is instead mounted to the projector's casing. In addition, the spatial modulators are not mounted to the desk's surface, but are mounted to the frame. The frame and the casing form part of the projector that sits on the desk. Furthermore, Uchiyama teaches that the projection system merely sits on the desk or the stand – Uchiyama does not teach that the desk or stand is part of the projection system itself.

Accordingly, the desk cannot reasonably be considered to be part of the projection system.

In view of the above, Uchiyama fails to teach all the elements of claim 1, and claim 1 is patentable over Uchiyama.

Claims 1 and 12 are rejected under 35 U.S.C. §102 (e) as being anticipated by Schehrer et al. (US Pub. No. 2002-0003508-A1) (Schehrer). Schehrer teaches an image generator having a miniature display device. The Office Action points particularly to FIGs 1A, 7, 8, and 10a to 10d.

FIG. 1 is a generic figure that shows generalized elements of the display device. In particular, FIG. 1A shows a box representing an image generator, a box representing optics and a human eye. FIG. 1A does not show a first light source mounted on a mounting surface of a mount, nor a reflective image display unit, nor a reflective polarizing film.

In the embodiment illustrated in FIG. 7, Schehrer teaches a light source (501) that directs light from a mirror (502) to a polarizing beamsplitter 505. The light reflected by the polarizing beamsplitter is directed to a spatial light modulator (SLM) 504. The modulated light reflected from the SLM passes through the polarizing beamsplitter to the viewing lens. In this particular embodiment, the light source is oriented so as to direct light in a direction that is parallel to the direction of light incident on the SLM. No mount having a mounting surface is shown in FIG. 7.

The embodiment illustrated in FIG. 8 shows an illumination generator 510 that directs light along a light pipe 511 to a turning mirror 512. The turning mirror directs the light to a polarizing beamsplitter 505, which reflects the light to the SLM (504). The illumination generator is oriented so that it directs light in a direction that is parallel to the direction in which light is incident on the SLM. No mount having a mounting surface is shown in FIG. 8.

The embodiment illustrated in FIGs. 10a-10d shows a display in which a light box (533) is mounted on a frame (534) that has two angled wings that support a turning mirror (532) (para. 68). The plane of the output port of the light box is tilted relative to the optical axis through the display (504) and the viewing lens (531) (para.

67). It is not clear whether or not the light box is mounted to the frame. The display, or SLM, is however, not mounted to the frame.

Applicants respectfully assert that Schehrer fails to teach all of the elements of claim 1. One example of the device of claim 1 is shown in FIG. 12 where, as a result of the light source and display being mounted on the same surface, the light from the light source is directed in the same direction as the direction of light reflected from the display.

Schehrer's display devices, on the other hand are different. Schehrer fails to teach that the light source is mounted on the same mounting surface as the reflective image display unit, and has a first axis parallel to the optical axis of the display unit. Instead, in the embodiments shown in FIGs. 7 and 8, there is no disclosure at all of how the display and the light source are mounted. It is unclear from these figures how the light source could be mounted on the same mounting surface as the display, given that the display and the light source are removed from each other and they do not share a common plane. In fact, the light sources of FIGs. 7 and 8 lie well out of the plane of the display so that the light generated by the light source initially propagates in the same direction as that of the light incident on the display. FIGs. 7 and 8 clearly fail to teach the claimed invention.

With regard to the device shown in FIGs. 10a-d, Schehrer likewise fails to teach that the light source is mounted on the same mounting surface as the reflective image display unit, and has a first axis parallel to the optical axis of the display unit. The light box is mounted below the turning mirror, in a position to the outside of the frame – see FIGs. 10a and 10c. The display, on the other hand is positioned to the other side of the frame - see FIG. 10a. Clearly, there is no common surface on the light source and the display are both mounted, and so Schehrer fails to teach the elements of claim 1.

Since Schehrer fails to teach the elements of claim 1, claim 1 is not anticipated by Schehrer and is, therefore, allowable thereover.

Dependent claim 12, which depends from claim 1 and further defines the invention of claim 1, was also rejected under 35 U.S.C. §102(e) as being anticipated

by Schehrer. While Applicants do not acquiesce with the particular rejection to this dependent claim, it is believed that this rejection is moot in view of the remarks made in connection with independent claim 1. Therefore, dependent claim 12 is also in condition for allowance.

Claims 1, 12 and 13 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Handschy et al. (US U.S. Patent No. 5,596,451) (Handschy). Handschy teaches, in FIG. 2B a projection system having an illumination arrangement (34) that directs light into a polarization cube (48). The light passes through the cube to a spatial light modulator (36) located on the other side of the cube from the illumination arrangement. Image light, reflected by the spatial light modulator, is deflected by the cube to a mirror (42). The image light also double-passes a quarter-wave plate so that the image light reflected by the mirror is directed through the cube to the viewer (24).

It is stated in the Office Action that Handschy fails to explicitly illustrate that the illuminated display device includes a mount having a mounting surface. It is further stated in the Office Action that it would have been obvious and/or within the level of one of ordinary skill in the art at the time the invention was made that each of the elements of the illuminated display device taught by Handschy would include a supporting substrate and it would have been obvious to mount the elements on the same supporting substrate in order to maintain better optical alignment when the display device is mounted onto a helmet or a pair of glasses.

Three criteria must be met to establish a *prima facie* case of obviousness. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference. Second, there must be a reasonable expectation of success. Finally, the prior art reference, or combination of references, must teach or suggest all the claim limitations. MPEP § 2142. Applicant respectfully traverses the rejection since the prior art fails to disclose all the claim limitations.

First, the polarizing beamsplitter does not direct light from the first light source to the reflective image light display unit, as is required by claim 1. Instead, in

Handschy's device, the light from the light source passes directly through the polarizing beamsplitter to the spatial light modulator. The polarizing beamsplitter serves the function of directing light reflected from the spatial light modulator to the curved mirror (42), which then reflects the light to the viewer. If the polarizing beamsplitter were removed from Handschy's device, the light from the light source would still reach the spatial light modulator: the polarizing beamsplitter does not direct the light to the spatial light modulator.

This is an important difference between Handschy's device and that of claim 1. In Handschy's device, the polarizing beamsplitter reflects the image light reflected by the spatial light modulator. This configuration makes high demands on the flatness of the polarizing beamsplitter in order to maintain an undistorted image. On the other hand, in claim 1, the reflective polarizing film directs the illumination light to the reflective image display. In the claimed configuration, the polarizing film is permitted to transmit the image light, rather than reflecting the image light. Since the polarizing film does not reflect the image from the reflective image display, the requirements on the flatness of the polarizing film are considerably relaxed, relative to those of Handschy's configuration.

Second, as admitted in the Office Action, Handschy is silent as to how the light source and spatial modulator are mounted, and does not teach or suggest a mount having a mounting surface. More importantly, Handschy fails to teach or suggest that the light source and the spatial light modulator are mounted on the same mounting surface. Applicants do not admit that it would have been obvious for Handschy's light source and spatial light modulator to be mounted on the same surface, especially since the light source and spatial light modulator are disposed on opposite sides of the polarizing beamsplitter.

In summary, Handschy fails to teach or suggest that the polarizing beamsplitter direct the light from the light source to the spatial light modulator in a configuration where the light source directs light along a first axis that is parallel to the axis spatial light modulator. Handschy also fails to teach or suggest that the light source and the spatial light modulator are mounted on the same surface of the mount.

Accordingly, since Handschy fails to teach or suggest all the elements of the claimed invention, claim 1 is not obvious in view of Handschy and is patentable thereover.

Dependent claims 12 and 13, which depend from claim 1 and further define the invention of claim 1, were also rejected under 35 U.S.C. §103(a) as being obvious in view of Handschy. While Applicants do not acquiesce with the particular rejections to these dependent claims, it is believed that these rejections are moot in view of the remarks made in connection with independent claim 1. Therefore, dependent claims 12 and 13 are also in condition for allowance.

Furthermore, claim 12 is directed to a reflector that is disposed to direct light from the first light source to the reflective polarizing film. Handschy fails to teach or suggest a mirror that directs light from the light source to a reflective polarizing film. Instead, Handschy teaches a mirror that reflects image light, received from the spatial light modulator, through the polarizing beamsplitter to the viewer.

Regarding claim 13, Handschy fails to teach or suggest that at least one of the reflector and the reflective polarizing film, that direct light to the reflective image display, is curved in at least one dimension to form a curved reflector.

Claims 2-9 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Uchiyama. It is stated in the Office Action that Uchiyama teaches all of the claimed subject matter except for the reflective polarizing film being curved. It is further stated in the Office action that it is well known to provide a curved reflective polarizer in the same field of endeavor or analogous art for the purpose of reducing the bulk and weight of a display system or alternating [sic] provide for light concentration, uniform light transmission and/or aberration correction. It is stated that it would have been obvious to modify Uchiyama's beamsplitter to include a curved reflective polarizer in order to increase light concentration, provide uniform light transmission or alternatively reduce optical aberrations, bulk and weight of the display system.

Claims 2-9 and 13-16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Schehrer. It is stated in the Office Action that Schehrer discloses all of the subject matter claimed except for the reflective polarizing film being curved, but

that it was well known to curve a reflective polarizer and that it would have been obvious to modify Schehrer's polarizing beamsplitter to include a curved reflective polarizer to increase light concentration, provide uniform light transmission or reduce optical aberrations, bulk and weight of the system.

Dependent claims 2-9 and 13-16, depend from claim 1 and further define the invention of claim 1. While Applicants do not acquiesce with the particular rejections to these dependent claims, it is believed that these rejections are moot in view of the remarks made above in connection with Uchiyama and Schehrer and independent claim 1. Therefore, dependent claims 2-9 and 13-16 are also in condition for allowance.

Regarding claim 2, it is stated in the Office Action that it is well known to use a curved reflective polarizing film. Applicants respectfully disagree that the use of a curved reflective polarizing film was well known.

Regarding claim 3 and 14, there is no disclosure, in Uchiyama, Schehrer or in the Office Action, that teaches or suggests that the reflective polarizing film is curved with a radius of curvature lying parallel to a plane formed by the first axis and the displacement direction.

Regarding claim 4 and 15, there is no disclosure, either in Uchiyama, Schehrer or in the Office Action that teaches or suggests that the reflective polarizing film is curved with a radius of curvature lying parallel to a plane formed by the first axis and an axis orthogonal to both the first axis and the displacement direction.

Regarding claim 5 and 16, there is nothing in Uchiyama, Schehrer or the Office Action that teaches or suggests that it is known to for the reflective polarizing film to be curved with a first radius of curvature lying parallel to a plane formed by the first axis and the displacement direction and be curved with a second radius of curvature lying parallel to a plane formed by the first axis and an axis orthogonal to both the first axis and the displacement direction.

Regarding claim 6, Uchiyama and Schehrer fail to teach or suggest that a first portion of the reflective polarizing film is displaced from the first light source along the first axis and a second portion of the reflective polarizing film is displaced from the

reflective image display unit along the optical axis. Instead, Uchiyama's and Schehrer's polarizing beamsplitters lie only on the first axis.

Regarding claims 7 - 9, which depend from claim 6, Uchiyama and Schehrer fail to teach or suggest either the first or second portions, or both of the first and second portions, of the polarizing film are curved.

Regarding claim 13, Schehrer fails to teach or suggest that at least one of the reflector or the reflective polarizing film is curved in at least one dimension.

Claims 2-9 and 14-16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Handschy in view of Handschy et al. (US Patent No. 5,808,800) (Handschy '800).

It is stated in the Office Action that Handschy teaches all of the claimed subject matter, except for the reflective polarizer being curved, and that Handschy '800 teaches that it is known to provide a curved reflective polarizer in the same field of endeavor for the purpose of reducing the bulk and weight of a display system.

The combination of Handschy with Handschy '800 fails to remedy the deficiencies of Handschy discussed above with respect to claims 1, 12 and 13.

Applicants respectfully assert that it would not be obvious to combine the teaching of Handschy '800 of using a curved reflective polarizer with that of Handschy to produce the claimed device.

If one were to accept, *arguendo*, that Handschy '800 teaches a curved polarizing beamsplitter, the proposed combination of references fails to produce the claimed arrangement. Replacing Handschy's polarizing beamsplitter (48) with a curved polarizing beamsplitter does not change the fact that in Handschy's design, the polarizing beamsplitter does not direct the light from the light source to the spatial light modulator but, instead, directs the light reflected from the spatial light modulator to the mirror. Accordingly, the proposed combination of references fails to teach or suggest all the elements of claims 2-9, and these claims are allowable.

Regarding claims 3-5, neither Handschy nor Handschy '800 teach or suggest that the first axis is displaced relative to the optical axis of the reflective image display, where the first axis and the optical axis are parallel. Instead, the axes of Handschy's

light source and spatial light modulator would appear to overlap, with no relative displacement between the two axes.

Regarding claims 4 and 5, neither Handschy nor Handschy '800 teach or suggest that the reflective polarizing film be curved with a radius of curvature lying parallel to a plane formed by the first axis and an axis orthogonal to both the first axis and the displacement direction. Instead, Handschy '800 only teaches that the polarizing beamsplitter be curved in the same plane as the plane of reflection.

Regarding claims 14-16, it is important to note that these claims all depend from claim 13 which, as was discussed above, includes a reflector disposed to direct light from the first light source to the reflective polarizing film. Neither Handschy nor Handschy '800 teach or suggest the reflector.

Furthermore, each of the claims 14-16 include the feature that the optical axis of the reflective image display unit is laterally displaced from the first axis in a displacement direction. Neither Handschy nor Handschy '800 Teach or suggest that there is a relative displacement between the first axis and the optical axis. Instead, Handschy's device, as shown in FIG. 2B, appears to have the axes overlapping. Therefore, the proposed combination fails to teach all the elements of claims 14 -16 and these claims are also allowable.

In view of the reasons provided above, it is believed that all pending claims are in condition for allowance. Applicants respectfully request favorable reconsideration and early allowance of all pending claims. Applicants also request that the species claims withdrawn from consideration be reinstated and allowed along with the currently pending claims.

If a telephone conference would be helpful in resolving any issues concerning this communication, please contact Iain A. McIntyre at 952-253-4110.

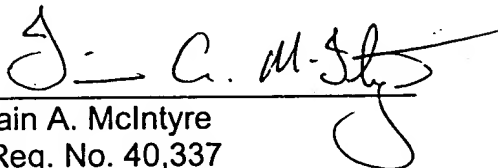
Respectfully submitted,

Altera Law Group , LLC



Date: December 12, 2002

By:


Iain A. McIntyre
Reg. No. 40,337
Direct Dial: 952.253.4110

IAM/vlb

Appendix A
Marked Up Version of the Entire Claim Set

Kindly amend claim 12.

1. (unchanged) An illuminated display device, comprising:
a first light source disposed on a mount having a mount surface and directing light generally along a first axis;
a reflective image display unit disposed on the mount surface with an optical axis substantially parallel to the first axis; and
a reflective polarizing film disposed to direct light from the first light source to the reflective image light display unit.
2. (unchanged) A device as recited in claim 1, wherein the reflective polarizing film is curved in at least one dimension.
3. (unchanged) A device as recited in claim 2, wherein the optical axis of the reflective image display unit is laterally displaced from the first axis in a displacement direction and the reflective polarizing film is curved with a radius of curvature lying parallel to a plane formed by the first axis and the displacement direction.
4. (unchanged) A device as recited in claim 2, wherein the optical axis of the reflective image display unit is laterally displaced from the first axis in a displacement direction and the reflective polarizing film is curved with a radius of curvature lying parallel to a plane formed by the first axis and an axis orthogonal to both the first axis and the displacement direction.
5. (unchanged) A device as recited in claim 2, wherein the optical axis of the reflective image display unit is laterally displaced from the first axis in a displacement direction and the reflective polarizing film is curved with a first radius of curvature lying parallel to a plane formed by the first axis and the displacement

direction and is curved with a second radius of curvature lying parallel to a plane formed by the first axis and an axis orthogonal to both the first axis and the displacement direction.

6. (unchanged) A device as recited in claim 2, wherein a first portion of the reflective polarizing film is displaced from the first light source along the first axis and a second portion of the reflective polarizing film is displaced from the reflective image display unit along the optical axis.

7. (unchanged) A device as recited in claim 6, wherein the first portion of the reflective polarizing film is curved.

8. (unchanged) A device as recited in claim 6, wherein the second portion of the reflective polarizing film is curved.

9. (unchanged) A device as recited in claim 6, wherein both the first and second portions of the reflective polarizing film are curved.

12. (once amended) A device as recited in claim 1, further comprising a reflector disposed to direct light from the first light source to the reflective polarizing film [layer].

13. (unchanged) A device as recited in claim 12, wherein at least one of the reflector and the reflective polarizing film is curved in at least one dimension to form a curved reflector.

14. (unchanged) A device as recited in claim 13, wherein the optical axis of the reflective image display unit is laterally displaced from the first axis in a displacement direction and the reflective polarizing film is curved with a radius of curvature lying parallel to a plane formed by the first axis and the displacement direction.

15. (unchanged) A device as recited in claim 13, wherein the optical axis of the reflective image display unit is laterally displaced from the first axis in a displacement direction and the reflective polarizing film is curved with a radius of curvature lying parallel to a plane formed by the first axis and an axis orthogonal to both the first axis and the displacement direction.

16. (unchanged) A device as recited in claim 13, wherein the optical axis of the reflective image display unit is laterally displaced from the first axis in a displacement direction and the reflective polarizing film is curved with a radius of curvature lying parallel to a plane formed by the first axis and the displacement direction and is curved with another radius of curvature lying parallel to a plane formed by the first axis and an axis orthogonal to both the first axis and the displacement direction.

Appendix 2H



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20591
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/498,801	01/31/2000	Clary T. Hoyd	55241USA97A U.S.002	9317

7590

01/08/2003

Attention William D Miller
Office Of Intellectual Property Counsel
3M Innovative Properties Company
PO BOX 33427
St.Paul, MN 55133-3427

OFFICE OF INTELLECTUAL
PROPERTY COUNSEL
3M INNOVATIVE PROPERTIES COMPANY

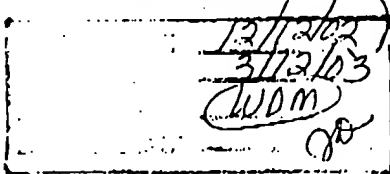
EXAMINER

SHAHER, RICKY D

ART UNIT PAPER NUMBER

2872

DATE MAILED: 01/08/2003



12/1/02
3/17/03
Fixed
JAN 13 2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

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JAN 17 2003

WILLIAM D. MILLER

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09/498,801

ADDRESS: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
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EXAMINER

ART UNIT	PAPER NUMBER
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DATE MAILED:

16

Below is a communication from the *EXAMINER* in charge of this application
COMMISSIONER OF PATENTS AND TRADEMARKS

ADVISORY ACTION**THE REPLY FILED FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.**

Therefore, further action by the applicant is required to avoid abandonment of this application. A proper reply to a final rejection under 37 CFR 1.113 may only be either: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114.

PERIOD FOR REPLY (check only a) or b))

- a) ☒ The period for reply expires 3 months from the mailing date of the final rejection.
- b) ☐ In view of the early submission of the proposed reply (within two months as set forth in MPEP § 707.07(d)), the period for reply expires on the mailing date of this Advisory Action, OR continues to run from the mailing date of the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

1. ☐ A Notice of Appeal was filed on _____. Appellant's Brief must be filed within the period set forth in 37 CFR 1.192(a), or any extension thereof (37 CFR 1.191(d)), to avoid dismissal of the appeal.
2. ☒ The proposed amendment(s) will be entered upon the timely submission of a Notice of Appeal and Appeal Brief with requisite fees.
3. ☐ The proposed amendment(s) will not be entered because:
- (a) ☐ they raise new issues that would require further consideration and/or search. (see NOTE below);
 - (b) ☐ they raise the issue of new matter. (see NOTE below);
 - (c) ☐ they are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
 - (d) ☐ they present additional claims without cancelling a corresponding number of finally rejected claims.

NOTE:

4. ☐ Applicant's reply has overcome the following rejection(s):

5. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).

6. ☒ The a) ☐ affidavit, b) ☐ exhibit, or c) ☒ request for reconsideration has been considered but does NOT place the application in condition for allowance because: OF THE REASONS SET FORTH IN PAPER NO. 14

7. ☐ The affidavit or exhibit will NOT be considered because it is not directed SOLELY to issues which were newly raised by the Examiner in the final rejection.

8. ☐ For purposes of Appeal, the status of the claim(s) is as follows (see attached written explanation, if any):

Claim(s) allowed: _____

Claim(s) objected to: _____

Claim(s) rejected: 1-9 AND 12-16

Claim(s) withdrawn from consideration: 36-38

9. ☐ The proposed drawing correction filed on _____ a) ☐ has b) ☐ has not been approved by the Examiner.
10. ☐ Note the attached Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____
11. ☐ Other: _____



04-16-03

AF 12800
\$

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: G. Boyd et al.

Examiner: Ricky D. Shafer

Serial No.: 09/498801

Group Art Unit: 2872

Filed: January 31, 2000

Docket No.: 55241US002

Title: ILLUMINATION SYSTEM FOR REFLECTIVE DISPLAYS

CERTIFICATE UNDER 37 C.F.R. 1.10:

'Express Mail' mailing number: EL 733178288 US

Date of Deposit: April 14, 2003

The undersigned hereby certifies that this Transmittal Letter and the paper or fee, as described herein, are being deposited with the United States Postal Service 'Express Mail Post Office To Addressee' service under 37 CFR 1.10 and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

By: Lee Thao

Lee Thao

Box AF
Assistant Commissioner for Patents
Washington, D.C. 20231

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- ☒ Appellant's Brief On Appeal, with Appendices A-H, in triplicate
- ☒ Check(s) in the amount of \$320.00 for Appeal Brief Fee
- ☒ Petition for Extension of Time, Check for \$110.00
- ☒ Transmittal Sheet
- ☒ Return postcard

Authorization is hereby given to charge any additional fees or credit any overpayments that may be deemed necessary to Deposit Account Number 50-1038.

Respectfully submitted,

Altera Law Group, LLC



Date: April 14, 2003

By: J. A. McIntyre

Jain A. McIntyre
Reg. No. 40,337
IAM/vlb



#20/EXT ①
4-24-03
PATENT Hayes

Serial No. 09/498801

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: G. Boyd et al. Examiner: Ricky D. Shafer
Serial No. 09/498801 Group Art Unit: 2872
Filed: January 31, 2000 Docket No. 00810.0502-US-01
Title: ILLUMINATION SYSTEM FOR REFLECTIVE DISPLAYS

CERTIFICATE UNDER 37 C.F.R. 1.10:
'Express Mail' mailing number: EL 733178288 US
Date of Deposit: April 14, 2003
The undersigned hereby certifies that this Transmittal Letter and the paper or fee, as described herein, are being deposited with the United States Postal Service 'Express Mail Post Office To Addressee' service under 37 CFR 1.10 and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.
By: Lee Thao
Lee Thao

PETITION FOR EXTENSION OF TIME UNDER 37 C.F.R. §1.136(a)

Assistant Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

This is a request under 37 C.F.R. §1.136(a) to extend the period for filing a brief to the Notice of Appeal filed January 13, 2003. This is a request for a one month extension of time from March 13, 2003, to April 13, 2003. Also enclosed is a check in the amount of \$110.00, the required fee for this extension of time.

Please consider this a petition to extend the time to respond if an additional extension of time is deemed necessary by the Office. Authorization is hereby given to charge Deposit Account Number 50-1038 if such additional extension is necessary.

Respectfully submitted,
Altera Law Group, LLC

04/17/2003 RNEBRAHT 00000140 09498801
02 FC:1251 110.00 OP



Date: April 14, 2003

By: Iain A. McIntyre
Iain A. McIntyre
Reg. No. 40,337
IAM/vib

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Serial No. 09/498801

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: G. Boyd et al.

Examiner: Ricky D. Shafer

Serial No.: 09/498801

Group Art Unit: 2872

Filed: 1/31/2000

Docket No.: 55241US002

Title: ILLUMINATION SYSTEM FOR REFLECTIVE DISPLAYS

PATENT

#21 / App'd
Brief
4-24-03
Hayes

CERTIFICATE UNDER 37 C.F.R. 1.10:

'Express Mail' mailing number: EL 733178288 US

Date of Deposit: April 14, 2003

The undersigned hereby certifies that this Transmittal Letter and the paper or fee, as described herein, are being deposited with the United States Postal Service 'Express Mail Post Office To Addressee' service under 37 CFR 1.10 and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

By: Lee Thao

Lee Thao

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APR 17 2003

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APPELLANT'S BRIEF ON APPEAL

BOX AF

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

This Appeal Brief is presented in support of the Notice of Appeal submitted to the U.S. Patent and Trademark Office by facsimile on January 13, 2003, from the final rejection of claims 1-9 and 12-16 of the above-identified application, as set forth in the Office Action dated September 12, 2003.

A check for \$320.00 to cover the required fee for filing this Brief is enclosed. An original and two copies of the Brief are enclosed herewith.

I. REAL PARTY OF INTEREST

The Real Party of Interest is 3M Innovative Properties Company, a Delaware corporation and a wholly owned subsidiary of 3M Company. 3M Innovative Properties Company is the assignee of the instant application.

04/17/2003 RMEBRAHT 00000140 09498801

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II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences for the above-referenced patent application.

III. STATUS OF CLAIMS

Claims 1-9 and 12-16, as set forth in Appendix 1 attached herewith, are pending and are the subject of the present appeal.

The case was originally filed with claims 1-35. In a paper issued on May 22, 2001 (Appendix 2-A), Applicants were required to elect one of twelve species. In a response dated June 6, 2001 (Appendix 2-B), Applicants provisionally elected species E, indicating that claims 1-3, 10-14, 17-21, 26 and 28-35 read on the elected species. A second species election was issued on August 27, 2001 (Appendix 2-C), but this was withdrawn following an interview between the below-signed attorney and Ms. Cassandra Spyrou, SPE. In the interview, there was oral agreement to restrict the case to claims 2-9 and 12-16, and generic claim 1, and to withdraw claims 10, 11 and 17-35. This restriction was confirmed in the Office Action dated Feb. 13, 2002 (Appendix 2-D).

In a subsequent response, mailed on June 13, 2002 (Appendix 2-E), Applicants added new claims 36-38. In the Final Office Action dated Sept. 12, 2002 (Appendix 2-F), claims 36-38 were withdrawn from consideration. Consequently, claims 10, 11 and 17-38 are currently withdrawn from consideration, and claims 1-9 and 12-16 are pending.

IV. STATUS OF AMENDMENTS

An Amendment, responsive to the final Office Action dated September 12, 2002, was submitted by Applicants on December 12, 2002 (Appendix 2-G). In this Amendment, claim 12 was amended and arguments were presented distinguishing the claimed subject matter from the cited prior art.

By way of Advisory Action mailed January 8, 2003 (Appendix 2-H), this Response was deemed not to place the application in condition for allowance. It was stated in the Advisory Action, however, that the amendment to claim 12 will be entered

upon filing of this Appeal Brief. The Advisory Action indicated that the claimed subject matter remained rejected for the reasons set forth in the final Office Action. Consequently, the list of claims presented in Appendix 1 includes the amendment to claim 12 submitted on December 12, 2002.

V. SUMMARY OF THE INVENTION

The invention is generally directed to an illuminated display device, for example as might be used in the eyepiece of a video camera (FIG. 2), or the like. A general embodiment of the illuminated display device is schematically presented in FIG. 5, and is described at page 8, lines 10-28. FIG. 5 shows a light source 502 that directs light 510 generally along a first axis 504 to a reflective image display unit 506 via a reflective polarizing film 512. The reflective image display unit 506 is disposed with its optical axis 508 substantially parallel to the first axis 504 of the light source. The light directed to the reflective image display unit 506 is in the polarization state that is reflected by the reflective polarizing film. The reflective image display unit 506 modifies the polarization of various portions of the incident light, so that the reflected light contains a polarization-modified image. The reflected light is incident on the reflective polarizer film 512, which transmits that portion of the polarization-modified image that is in the pass polarization state, and which rejects that portion of the light that is in the reflected polarization state. This separates the image light from the unwanted light so that the viewer is able to perceive the image by viewing the light transmitted through the reflective polarizer film 512 from the image display unit 506.

Several examples of the particular invention of the claim 1 are described in the drawings. One example is schematically represented in FIGs. 11A-11C, and described at page 17, line 11 – page 18, line 17. The display device includes a first light source 1102 on a mount having a mount surface and directing light generally along a first axis. A reflective image display unit 1104 is also disposed on the mount surface with an optical axis substantially parallel to the first axis. A reflective polarizing film is disposed to direct light from the first light source to the reflective image display unit.

Claim 2 is directed to the reflective polarizing film being curved in at least one direction, for example as is described in the Specification at page 13, line 13 – page 14, line 6 and, for example illustrated as reflective polarizer 822 in FIG. 8B. Other examples of the invention of claim 2 are presented in the application.

Claim 3, which depends from claim 2, is directed to the optical axis of the reflective image display unit being laterally displaced from the first axis in a displacement direction and the reflective polarizing film is curved with a radius of curvature lying parallel to a plane formed by the first axis and the displacement direction. One example of this is schematically illustrated as the reflective polarizer 822 in FIG. 8B, described at p. 13, lines 18-21. Other examples of the invention of claim 3 are presented in the application.

Claim 4, which depends from claim 2, is directed to the optical axis of the reflective image display unit being laterally displaced from the first axis in a displacement direction and the reflective polarizing film being curved with a radius of curvature lying parallel to a plane formed by the first axis and an axis orthogonal to both the first axis and the displacement direction. One example of this is schematically illustrated in FIG. 8C, which shows a reflective polarizer 832 that is curved out of the plane of the figure, and is described at page 14, lines 3–5. Other examples of the invention of claim 4 are presented in the application.

Claim 5, which depends from claim 2, is directed to the optical axis of the reflective image display unit being laterally displaced from the first axis in a displacement direction. The reflective polarizing film is curved with a first radius of curvature lying parallel to a plane formed by the first axis and the displacement direction and is curved with a second radius of curvature lying parallel to a plane formed by the first axis and an axis orthogonal to both the first axis and the displacement direction. One example of this is schematically illustrated in FIG. 8C, which shows a reflective polarizer 832 that is curved out of the plane of the figure, and is described at page 14, lines 3–5. Other examples of the invention of claim 5 are presented in the application.

Claim 6, which depends from claim 2, is directed to a first portion of the reflective polarizing film being displaced from the first light source along the first axis and a

second portion of the reflective polarizing film being displaced from the reflective image display unit along the optical axis. One example of this is illustrated in FIG. 9B, which shows a reflective polarizer 922 having a portion above the light source 902 and a portion above the image display unit 906. This is described at page 15, lines 17-23. Other examples of the invention of claim 6 are also presented in the application.

Claim 7, which depends from claim 6, is directed to the first portion of the reflective polarizing film being curved. One example of this is illustrated in FIG. 9B, which shows a reflective polarizer 922 having a curved portion above the light source 902. This is described at page 15, lines 17-23. Other examples of the invention of claim 7 are presented in the application.

Claim 8, which depends from claim 6, is directed to the second portion of the reflective polarizing film being curved. One example of this is illustrated in FIG. 9B, which shows a reflective polarizer 922 having a curved portion above the image display unit 906. This is described at page 15, lines 17-23. Other examples of the invention of claim 8 are presented in the application.

Claim 9, which depends from claim 6, is directed to both the first and second portions of the reflective polarizing film being curved. One example of this is schematically presented in FIG. 9B, which shows a reflective polarizer 922 having a curved portion above the light source 902 and a curved portion above the image display unit 906. This is described at page 15, lines 17-23. Other examples of the invention of claim 9 are presented in the application.

Claim 12, which depends from claim 1, is directed to a reflector that is disposed to direct light from the first light source to the reflective polarizing film. One example of this is schematically illustrated in FIG. 5, in which the reflector 514 directs light 510 from the light source 502 to the image display unit 506. This is described at page 8, lines 16-28. Other examples of the invention of claim 12 are presented in the application.

Claim 13, which depends from claim 12, is directed to at least one of the reflector and the reflective polarizing film being curved in at least one dimension to form a curved reflector. One example of this is presented in FIG. 7A, which shows a curved reflector 714 and a curved reflective polarizer 712. This is described at page 11, line 31 – page

12, line 10. Other examples of the invention of claim 13 are presented in the application.

Claim 14, which depends from claim 13, is directed to the optical axis of the reflective image display unit being laterally displaced from the first axis in a displacement direction. The reflective polarizing film is curved with a radius of curvature lying parallel to a plane formed by the first axis and the displacement direction. One example of this is schematically illustrated as the reflective polarizer 822 in FIG. 8B, described at p. 13, lines 18-21. Other examples of the invention of claim 14 are presented in the application.

Claim 15, which depends from claim 13, is directed to the optical axis of the reflective image display unit being laterally displaced from the first axis in a displacement direction. The reflective polarizing film is curved with a radius of curvature lying parallel to a plane formed by the first axis and an axis orthogonal to both the first axis and the displacement direction. One example of this is schematically illustrated in FIG. 8C, which shows a reflective polarizer 832 that is curved out of the plane of the figure, and is described at page 14, lines 3-5. Other examples of the invention of claim 15 are presented in the application.

Claim 16, which depends from claim 13, is directed to the optical axis of the reflective image display unit being laterally displaced from the first axis in a displacement direction. The reflective polarizing film is curved with a first radius of curvature lying parallel to a plane formed by the first axis and the displacement direction and is curved with a second radius of curvature lying parallel to a plane formed by the first axis and an axis orthogonal to both the first axis and the displacement direction. One example of this is schematically illustrated in FIG. 8C, which shows a reflective polarizer 832 that is curved out of the plane of the figure, and is described at page 14, lines 3-5. Other examples of the invention of claim 16 are presented in the application.

VI. ISSUES PRESENTED FOR REVIEW

A. Whether claim 1, is rejected under 35 U.S.C. § 102(b) as being anticipated by Uchiyama et al. (U.S. Patent No. 5,800,032) (Uchiyama).

B. Whether claims 1 and 12 are rejected under 35 U.S.C. § 102(e) as being anticipated by Schehrer et al. (U.S. Pub. No. 2002-0003508-A1) (Schehrer).

C. Whether claims 1, 12 and 13 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Handschy et al. (U.S. Patent No. 5,596,451) (Handschy '451).

D. Whether claims 2-9 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Uchiyama.

E. Whether claims 2-9 and 13-16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Schehrer.

F. Whether claims 2-9 and 14-16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Handschy '451 in view of Handschy et al. (US Patent No. 5,808,800) (Handschy '800).

VII. GROUPING OF CLAIMS

For consideration on this appeal, Appellant has grouped the Claims according to the grounds of rejection made in the final Office Action, as shown below:

Issue A: Claim 1 only

Issue B: Group 1: Claims 1 and 12

Issue C: Group 1: Claim 1, 12 and 13

*NO STAMP on FALL
Group 1: STAMP AND
FALL TOGETHER*

7 Group 1: STAMP AND FALL TOGETHER

Issue D: Group 1: Claims 2-9

Issue E: Group 1: Claims 2-9, 13-16

Issue F: Group 1: Claims 2-9, 14-16

VIII. ARGUMENTS

Issue A: 102 Rejection of claim 1 based on Uchiyama

Claim 1 is rejected under 35 U.S.C. §102 (b) as being anticipated by Uchiyama et al. (U.S. Patent No. 5,800,032) (Uchiyama).

Uchiyama teaches, for example as disclosed in FIGs. 2 and 16, a projection system that has a light source (2) fixed to a fixing member (8) that is mounted on the upper, inside surface of a case (1). Light from the light source passes into a polarized beam splitter (4), which directs the light to a cross dichroic mirror (5). The cross dichroic mirror separates the incoming light into three different color bands, blue, green and red, and directs each color band to respective light modulation elements (6B, 6G and 6R). The cross dichroic mirror, the polarized beam splitter and the modulation elements are supported on a frame (9) within the case (col. 1, line 65 – col., 2, line 3).

The light modulation elements spatially modulate the light, which is then reflected and combined in the dichroic mirror. The modulated light passes through the polarized beam splitter to the projection optical system (7), which transmits the image to a projection screen. The projector system is placed on a desk or special stand (10) and the height of the case on the stand is adjustable via the use of height adjusting mechanisms (13) (col. 2, lines 4-18).

The invention of claim 1 is directed to an illuminated display device that includes a first light source disposed on a mount having a mount surface. The first light source directs light generally along a first axis. A reflective image display unit is disposed on the mount surface with an optical axis substantially parallel to the first axis. A reflective

polarizing film is disposed to direct light from the first light source to the reflective image light display unit.

To anticipate a claim, the reference must teach every element of the claim. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628,631, 2 USPQ2d 1051 1053 (Fed. Cir.) 1987). "The identical invention must be shown in as complete detail as is contained in the...claim." Richardson v. Suzuki Motor Co., 868 F. 2d1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Therefore, if a reference does not teach every element of the claim, then the reference does not anticipate the claim (MPEP § 2131).

Uchiyama fails to teach all the elements of claim 1. According to claim 1, the first light source and the reflective image display unit are both mounted to the same mount surface of the mount. Uchiyama fails to teach this arrangement of components. Instead, Uchiyama teaches, in FIGs. 2 and 16, that the light source is mounted to a fixing member that is suspended from the upper surface of the projector casing. The blue spatial light modulator is mounted to the cross-dichroic mirror and the red spatial light modulator is mounted between the cross dichroic mirror and the frame. Neither of the red or blue modulators are mounted to the fixing member, nor is the light source mounted to the mounting surface of the frame. Accordingly, Uchiyama fails to teach that the first light source and the image display unit are mounted on the same surface.

It is stated in the Office Action of Sept. 12, 2003, that Uchiyama's desk or stand (10) may be taken as being the mount of claim 1. Applicants respectfully disagree with such a characterization of the reference. The light source is not mounted to the desk's surface, but is instead mounted to the projector's casing. In addition, the spatial modulators are not mounted to the desk's surface, but are mounted to the frame. The frame and the casing form part of the projector that sits on the desk. Furthermore, Uchiyama teaches that the projection system merely sits on the desk or the stand – Uchiyama does not teach that the desk or stand is part of the projection system itself. Accordingly, the desk cannot reasonably be considered to be part of the projection system.

In view of the above, Uchiyama fails to teach all the elements of claim 1, and claim 1 is patentable over Uchiyama.

Issue B: 102 Rejection of claims 1 and 12 based on Schehrer

Claims 1 and 12 are rejected under 35 U.S.C. §102 (e) as being anticipated by Schehrer et al. (U.S. Pub. No. 2002-0003508-A1) (Schehrer).

Schehrer teaches an image generator having a miniature display device. The Office Action of Sept. 12, 2002, points particularly to FIGs 1A, 7, 8, and 10a - 10d as being the most relevant figures.

FIG. 1 is a generic figure that shows generalized elements of the display device. In particular, FIG. 1A shows a box representing an image generator, a box representing optics and a human eye. FIG. 1A does not show a first light source mounted on a mounting surface of a mount, nor a reflective image display unit, nor a reflective polarizing film.

In the embodiment illustrated in FIG. 7, Schehrer teaches a light source (501) that directs light from a mirror (502) to a polarizing beamsplitter 505. The light reflected by the polarizing beamsplitter is directed to a spatial light modulator (SLM) 504. The modulated light reflected from the SLM passes through the polarizing beamsplitter to the viewing lens. In this particular embodiment, the light source is oriented so as to direct light in a direction that is parallel to the direction of light incident on the SLM. No mount having a mounting surface is shown in FIG. 7.

The embodiment illustrated in FIG. 8 shows an illumination generator 510 that directs light along a light pipe 511 to a turning mirror 512. The turning mirror directs the light to a polarizing beamsplitter 505, which reflects the light to the SLM (504). The illumination generator is oriented so that it directs light in a direction that is parallel to the direction in which light is incident on the SLM. No mount having a mounting surface is shown in FIG. 8.

The embodiment illustrated in FIGs. 10a-10d shows a display in which a light box (533) is mounted on a frame (534) that has two angled wings that support a turning mirror (532) (para. 68). The plane of the output port of the light box is tilted relative to

the optical axis through the display (504) and the viewing lens (531) (para. 67). It is not clear whether or not the light box is mounted to the frame. The display, or SLM, is however, not mounted to the frame.

Applicants respectfully assert that Schehrer fails to teach all of the elements of claim 1. In particular, Schehrer fails to teach that the light source is mounted on the same mounting surface as the SLM, and has a first axis parallel to the optical axis of the SLM. Instead, in the embodiments shown in FIGs. 7 and 8, no disclosure is provided to explain how the SLM and the light source are mounted. It is unclear from these figures how the light source could be mounted on the same mounting surface as the SLM, given that the display and the light source are removed from each other, do not share a common plane and, in fact, point in opposite directions. Instead, the light sources of FIGs. 7 and 8 lie well out of the plane of the SLM so that the light generated by the light source initially propagates in the same direction as that of the light incident on the display. This is different from the claimed invention where, as a result of the claimed structure, the light generated from the light source initially propagates in substantially the same direction as that of light reflected from the imager, and not in the same direction as light incident on the imager (for an example see FIG. 12 of the present invention).

With regard to the device shown in FIGs. 10a-d, Schehrer likewise fails to teach that the light source is mounted on the same mounting surface as the reflective image display unit, and has a first axis parallel to the optical axis of the display unit. The light box is mounted below the turning mirror, in a position to the outside of the frame – see FIGs. 10a and 10c. The SLM, on the other hand is positioned to the other side of the frame - see FIG. 10a. Clearly, there is no common surface on which the light source and the display are both mounted, and so Schehrer's FIGs. 10a-d also fail to show the elements of claim 1.

Since Schehrer fails to teach the elements of claim 1, claim 1 is not anticipated by Schehrer and is, therefore, allowable thereover.

Dependent claim 12, which depends from claim 1 and further defines the invention of claim 1, was also rejected under 35 U.S.C. §102(e) as being anticipated by

Schehrer. While Applicants do not acquiesce with the particular rejection to this dependent claim, it is believed that this rejection is moot in view of the remarks made in connection with independent claim 1. Therefore, dependent claim 12 is also in condition for allowance.

Issue C: 103 Rejection of claims 1, 12 and 13 based on Handschy '451

Claims 1, 12 and 13 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Handschy et al. (U.S. Patent No. 5,596,451) (Handschy '451). The Office Action points out the embodiment shown by Handschy '451 in FIG. 2B as being particularly relevant.

Handschy '451 teaches, in FIG. 2B, a projection system having an illumination arrangement (34) that directs light into a polarization cube (48). The light passes through the cube to a spatial light modulator (36) (SLM) located on the other side of the cube from the illumination arrangement. Image light, reflected by the SLM, is deflected by the cube to a mirror (42). The image light also double-passes a quarter-wave plate so that the image light reflected by the mirror is directed through the cube to the viewer (24).

It is stated in the Office Action that Handschy fails to explicitly illustrate that the illuminated display device includes a mount having a mounting surface. It is further stated in the Office Action that it would have been obvious and/or within the level of one of ordinary skill in the art at the time the invention was made that each of the elements of the illuminated display device taught by Handschy would include a supporting substrate and it would have been obvious to mount the elements on the same supporting substrate in order to maintain better optical alignment when the display device is mounted onto a helmet or a pair of glasses.

Three criteria must be met to establish a *prima facie* case of obviousness. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference. Second, there must be a reasonable expectation of success. Finally, the prior art reference, or combination of references, must teach or suggest all the claim

limitations. MPEP § 2142. Applicant respectfully traverses the rejection since the prior art fails to disclose all the claim limitations, and one of ordinary skill in the art would not have been motivated to modify the device taught by Handschy in the manner proposed.

Group 1

First, Handschy '451 does not teach or suggest a polarizing beamsplitter that directs light from the first light source to the reflective image light display unit, as is required by claim 1. Instead, in the Handschy '451 device, the light from the light source passes directly through the polarizing beamsplitter to the SLM. In the Handschy '451 device, the polarizing beamsplitter serves the function of directing light reflected from the SLM to the curved mirror (42), which then reflects the light to the viewer. If the polarizing beamsplitter were removed from the Handschy '451 device, the light from the light source would still reach the SLM. Thus, the polarizing beamsplitter in the Handschy '451 device does not direct the light from the light source to the SLM.

This is an important difference between the Handschy '451 device and that of claim 1. In the Handschy '451 device, the polarizing beamsplitter reflects the image light reflected by the SLM. This configuration makes high demands on the flatness of the polarizing beamsplitter in order to maintain an undistorted image. On the other hand, in claim 1, the reflective polarizing film directs the illumination light to the reflective image display. As a result of the claimed configuration, the polarizing film transmits the image light, rather than reflecting the image light. Since the polarizing film of claim 1 does not reflect the image from the reflective image display, the requirements on the flatness of the polarizing film are considerably relaxed, relative to those in the configuration shown in Handschy '451.

Accordingly, Handschy fails to teach all the elements of claim 1.

Second, as is admitted in the Office Action of Sept 12, 2002, Handschy '451 is silent as to how the light source and spatial modulator are mounted, and does not teach or suggest a mount having a mounting surface. More importantly, Handschy '451 fails to teach or suggest that the light source and the spatial light modulator are mounted on the same mounting surface. In fact, Handschy '451 teaches a light source that is

placed in a position opposing the SLM and could not, therefore, be mounted on the same surface as the SLM. As was indicated above in the discussion of Schehrer, as a result of the claimed structure, the light generated from the light source initially propagates in substantially the same direction as that of light reflected from the imager, and not in the same direction as light incident on the imager. In contrast, in the device taught by Handschy '451, the light from the light source propagates in a direction substantially opposite that direction of the light reflected from the SLM.

Accordingly, it would not have been obvious to modify the device taught by Handschy '451 in the proposed manner to achieve the claimed invention, since placing the light source and SLM on the same mounting surface would have led to an inoperative device.

In summary, Handschy '451 fails to teach or suggest that the polarizing beamsplitter directs the light from the light source to the spatial light modulator in a configuration where the light source directs light along a first axis that is parallel to the axis spatial light modulator. Handschy '451 also fails to teach or suggest that the light source and the spatial light modulator are mounted on the same mounting surface.

Accordingly, since Handschy fails to teach or suggest all the elements of the claimed invention, claim 1 is not obvious in view of Handschy and is patentable thereover.

Dependent claims 12 and 13 are, for the purpose of this appeal, grouped with claim 1 and stand or fall with claim 1. Appellants do not admit, however, that claims 12 and 13 are not independently patentable 1.

Issue D: 103 Rejection of claims 2-9 based on Uchiyama.

For the purposes of this appeal only, claims 2-9 are grouped together. *stand or fall*
Appellants do not admit that there are no patentable differences among claims 2-9. Claims 2-9 depend from claim 1, either directly or indirectly. Since claim 1 is allowable, these claims are also allowable.

*point argue PFACE TO POINT 14
Error exists.*

Does Not include

Issue E: 103 Rejection of claims 2-9 and 13-16 based on Schehrer

For the purposes of this appeal only, claims 2-9 and 13-16 are grouped together. Appellants do not admit that there are no patentable differences among claims 2-9 and 13-16. Claims 2-9 and 13-16 depend from claim 1, either directly or indirectly. Since claim 1 is allowable, these claims are also allowable.

Issue F: 103 Rejection of claims 2-9 and 14-16 based on Handschy '451

Claims 2-9 and 14-16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Handschy '451 in view of Handschy et al. (US Patent No. 5,808,800) (Handschy '800).

It is stated in the Office Action that Handschy '451 teaches all of the claimed subject matter, except for the reflective polarizer being curved, and that Handschy '800 teaches that it is known to provide a curved reflective polarizer in the same field of endeavor for the purpose of reducing the bulk and weight of a display system. It is further stated that it would have been obvious and/or within the level of one of ordinary skill in the art at the time the invention was made to modify the reflective polarizer (polarizing beam splitting cube) of Handschy '451 to include a curved reflective polarizer as taught by Handschy '800 in order to reduce the bulk and weight of the system.

Handschy '800 shows, in FIG. 11, a system having a light source (28) and a SLM (46). The light source directs light at an angle to axis of the SLM, towards a polarizing beamsplitter (102) that has a curved surface. The polarizing beamsplitter directs the illumination light to the SLM. The light reflected by the SLM passes through the polarizing beamsplitter to the eyepiece lens (36).

Handschy '800 fails to correct the deficiencies of Handschy '451 discussed above.

For the purposes of this appeal only, claims 2-9 and 14-16 are grouped together. Appellants do not admit that there are no patentable differences among claims 2-9 and 14-16. Claims 2-9 and 14-16 depend from claim 1, either directly or indirectly. Since claim 1 is allowable, these claims are also allowable.

CONCLUSION

Appellants respectfully submit that claims 1 and 12 are not anticipated by the cited art and that no *prima facie* showing of obviousness has been established with respect to claims 1-9 and 12-16, the rejections of which are contested by Appellants. It is earnestly requested that the rejections be reversed, and that all of the pending claims 1-9, and 12-16 be allowed.

If a telephone conference would be helpful in resolving any issues concerning this communication, please contact Iain A. McIntyre at 952-253-4110.

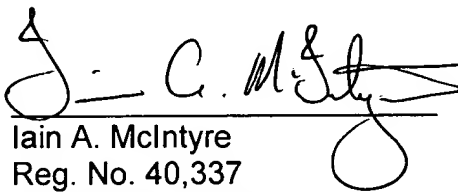
Respectfully submitted,

Altera Law Group , LLC



Date: April 14, 2003

By:


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APPENDIX 1
THE CLAIMS ON APPEAL (as finally amended)

1. An illuminated display device, comprising:
a first light source disposed on a mount having a mount surface and directing light generally along a first axis;
a reflective image display unit disposed on the mount surface with an optical axis substantially parallel to the first axis; and
a reflective polarizing film disposed to direct light from the first light source to the reflective image light display unit.
2. A device as recited in claim 1, wherein the reflective polarizing film is curved in at least one dimension.
3. A device as recited in claim 2, wherein the optical axis of the reflective image display unit is laterally displaced from the first axis in a displacement direction and the reflective polarizing film is curved with a radius of curvature lying parallel to a plane formed by the first axis and the displacement direction.
4. A device as recited in claim 2, wherein the optical axis of the reflective image display unit is laterally displaced from the first axis in a displacement direction and the reflective polarizing film is curved with a radius of curvature lying parallel to a plane formed by the first axis and an axis orthogonal to both the first axis and the displacement direction.
5. A device as recited in claim 2, wherein the optical axis of the reflective image display unit is laterally displaced from the first axis in a displacement direction and the reflective polarizing film is curved with a first radius of curvature lying parallel to a plane formed by the first axis and the

displacement direction and is curved with a second radius of curvature lying parallel to a plane formed by the first axis and an axis orthogonal to both the first axis and the displacement direction.

6. A device as recited in claim 2, wherein a first portion of the reflective polarizing film is displaced from the first light source along the first axis and a second portion of the reflective polarizing film is displaced from the reflective image display unit along the optical axis.

7. A device as recited in claim 6, wherein the first portion of the reflective polarizing film is curved.

8. A device as recited in claim 6, wherein the second portion of the reflective polarizing film is curved.

9. A device as recited in claim 6, wherein both the first and second portions of the reflective polarizing film are curved.

12. A device as recited in claim 1, further comprising a reflector disposed to direct light from the first light source to the reflective polarizing film.

13. A device as recited in claim 12, wherein at least one of the reflector and the reflective polarizing film is curved in at least one dimension to form a curved reflector.

14. A device as recited in claim 13, wherein the optical axis of the reflective image display unit is laterally displaced from the first axis in a displacement direction and the reflective polarizing film is curved with a radius of curvature lying parallel to a plane formed by the first axis and the displacement direction.

15. A device as recited in claim 13, wherein the optical axis of the reflective image display unit is laterally displaced from the first axis in a displacement direction and the reflective polarizing film is curved with a radius of curvature lying parallel to a plane formed by the first axis and an axis orthogonal to both the first axis and the displacement direction.

16. A device as recited in claim 13, wherein the optical axis of the reflective image display unit is laterally displaced from the first axis in a displacement direction and the reflective polarizing film is curved with a radius of curvature lying parallel to a plane formed by the first axis and the displacement direction and is curved with another radius of curvature lying parallel to a plane formed by the first axis and an axis orthogonal to both the first axis and the displacement direction.

APPENDIX 2
OFFICE ACTIONS AND AMENDMENTS/RESPONSES

- A. First Requirement to Elect Species, May 22, 2001
- B. Election of Species, June 6, 2001
- C. Second Requirement to Elect Species, August 27, 2001
- D. First Office Action, February 13, 2002
- E. Response to First Office Action, June 13, 2002
- F. Final Office Action, Sept 12, 2002
- G. Response to Final Office Action, December 12, 2002
- H. Advisory Action January 8, 2003